Technical Report REMR-OM-20
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US Army Corps of Engineers
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REMR Management Systems© BREAKWATER Computer Program User Manual (Version 1.0)

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Repair, Evaluation, Maintenance, and Rehabilitation Research Program

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Contents

Preface

The computer program described herein was authorized by Headquarters, US Army Corps of Engineers (HQUSACE), as part of the Operations Management problem area of the Repair, Evaluation, Maintenance, and Rehabilitation (REMR) Research Program. This work was performed as part of Civil Works Research Work Unit 32673 "Development of M&R Guidelines and Management Systems for Civil Work Structures" Mr. Don Plotkin is the Principal Investigator and Mr. Harold Tohlen (CECW-O) is the REMR technical monitor for this work.

Mr. David B. Mathis (CERD-C) is the REMR Coordinator at the Directorate of Research and Development, HQUSACE; Mr. Tohlen and Dr. Tony C. Liu (CECW-EG) serve as the REMR Overview Committee; Mr. William McCleese (CEWES-SC-A), US Army Engineer Waterways Experiment Station (WES), is the REMR Program Manager; Dr. Paul Howdyshell is the Problem Area Leader for the Operations Management problem area.

This work was conducted by the US Army Construction Engineering Research Laboratories, Facilities Technology Laboratory, Maintenance Management and Preservation Division (FL-P). Dr. Simon Kim is FL-P Division Chief.

The authors gratefully acknowledge the assistance of the Coastal Structure Advisory Group and many others throughout the Corps' coastal community whose excellent ideas helped guide this work.

COL James A. Walter is Commander of USACERL, and Dr. Michael J. O'Connor is Director.

1 Introduction

Background

In an effort to improve maintenance techniques and practices for inland waterway and coastal structures, the U.S. Army Corps of Engineers (USACE) established the Repair, Evaluation, Maintenance, and Rehabilitation Research (REMR) program. Within the REMR program is a group of projects dedicated to the development of computerized maintenance management systems for coastal and inland waterway navigational structures. The general intent of these REMR Management Systems is to provide maintenance managers at all levels with tools to promote easier and more effective maintenance and budget planning. Additional objectives are to create uniform procedures for assessing the condition of structures and to create assessment methods that will allow the condition of structures, and their parts, to be expressed numerically to take best advantage of the benefits available from the use of microcomputers in maintenance management.

The computer program described here is the initial version of the computer program for maintenance management of coastal structures. This version is a companion program for the Condition and Performance Rating Procedures for Rubble Breakwaters and Jetties, developed as part of REMR Work Unit 32672.

Objectives

The objectives of this phase of the project were to produce a computer program which would:

1. Allow the establishment of a database of rubble breakwaters and jetties.
2. Allow the collection of structure inspection and rating information, as required by the condition and performance rating procedures for rubble breakwaters and jetties developed under REMR Work Unit 32672.
3. Calculate Structural Index (SI), Functiponal Index (FI), and Condition Index (CI) values.
4. Produce a selection of reports showing inventory, inspection, and index data.

This manual describes the operation of the BREAKWATER program, version 1.0, which contains the basic features described in items (a) through (d) above.

Scope

The computer program described here represents the first stage in developing a maintenance management system for coastal navigation and protection structures. The computer software (currently called BREAKWATER) is a DOS-based program intended to handle the most basic maintenance management functions and calculate the required index values.

This initial program concentrates on breakwaters and jetties of rubble construction with either rock or concrete armor units. Future efforts will include system features for breakwaters and jetties of nonrubble construction and also seawalls, bulkheads, and revetments, as well as other desired management functions. Future versions of the program will be Windows-based and otherwise consistent with the most current operating and network systems in use at that time.

Approach

As a companion program to the condition and performance rating procedures for rubble breakwaters and jetties (developed under REMR Work Unit 32672), the program screens were made to closely match the inspection and rating forms developed for the field and office ratings and analysis. The method for calculating the index values is as described in the manual on "Condition and Performance Rating Procedures for Rubble Breakwaters and Jetties."

Mode of Technology Transfer

This manual is the primary means of technology transfer. As time and funding permit, program demonstrations and short classes will occasionally be conducted.

2 Overview

Program Description

This is the initial version of BREAKWATER—the REMR management system computer program for coastal structures. It was developed as part of the REMR (Repair, Evaluation, Maintenance, and Rehabilitation) research program (Work Unit 32673) sponsored and guided by the U.S. Army Corps of Engineers Directorate of Civil Works – Operations and Readiness Division.

This initial DOS-based version handles basic structural and functional information, reporting, and Condition Index (CI) calculations for rubble (or primarily rubble) breakwaters and jetties, with either rock or concrete armor units. It is a companion program for the manual on *Condition and Performance Rating Procedures for Rubble Breakwaters and Jetties*, also produced under the REMR program.

It is intended that future versions of BREAKWATER will be expanded to cover other types of coastal structures and to incorporate other modules and features needed to assist with maintenance management of these structures. Future versions will also include updated software.

Breakwater's Major Components

There are four components to the BREAKWATER Program.

Inventory

Inventory is the set of data that describes the location, dimensions, and general construction characteristics of each structure. It also indicates the division of the structures into reaches, the functions each structure (or reach) is intended to perform, and which Corps project the structure is part of. For each structure, a completed inventory data set defines that structure within the program so that all subsequent inspection and condition information can be properly associated with it. Details are in Chapter 3.

Inspection

Inspection is data that describes the physical condition and functional performance of a structure. Most inspection entires are either structural and functional numerical ratings (from which the

program calculates Condition Indexes) or comments that explain the rating choices and document other observations about the structure. Screens in the Inspection component follow the same format as the structural and functional rating forms used by inspectors and engineers. Details are in Chapter 4.

Reports and Forms

The reports and forms component offers the user a series of reports summarizing or detailing past inspections and pre-headed blank structural and functional rating forms for the next inspection and rating for a reach or structure. The Reports option contains the following five choices:

1. District Inventory Summary
2. Condition Index Calculation for Reaches
3. Historical Rating Summary
4. Comment Report for Reaches
5. Missing Information Report.

The Forms option contains the following five choices:

1. Blank Inspection Form
2. Date Selected Inspection Form
3. Project Selected Inspection Form
4. Structure Selected Inspection Form
5. Reach Selected Inspection Form

The forms are the same as those shown in the rating procedures manual. Details are in Chapter 5.

Database Administration

A database is a set of data for a group of coastal projects and thus typically contains data on many structures. In practice, it is expected that each Corps District will maintain one database for its structures, although smaller databases (as for Area Offices) are also possible.

The Database Administration component allows the user to perform these operations with databases:

1. Create databases (essentially giving them a name that defines them in the computer).
2. Select a database to work with.
3. Copy databases.
4. Merge databases (creates a Division database from two or more District databases).

5. Reorganize databases (restores them in the computer to occupy disk space most efficiently).
6. Delete databases.

All of these options can be performed on databases that are on a floppy disk, a hard drive, or a network drive. Details are in Chapter 6.

General Program Operation and Arrangement

Working with Data

Before any data can be entered, viewed, or edited, a database must be chosen or created. Do this by choosing (5) Database Administration from the main menu and then choose either (1) Select a Database or (6) Create a Database from the Database Administration menu.

The Two Menu Types

BREAKWATER is menu driven; that is, most operations are initiated by choosing a selection from a menu (or list) of options. There are two types of menus in the program. They appear in the following general formats:

1	2
[A] Option 1	**M**ain Menu
[B] Option 2	**S**ubmenu
[C] Option 3	Submenu **2**

In either type an option may be selected by:

1. Using the arrow keys to highlight the desired option and pressing the key labeled **[ENTER]**, or
2. Pressing the key designated as the **trigger.**

In column 1, the triggers are **A, B,** and **C**. In column 2 the triggers are **M, S**, and **2.**

Entering Data

Data entry is handled in two ways:

1. A **Pop-up Menu** system, where the appropriate data may be selected by the two methods described above.

2. Typing in the information, where the size of the box indicates the amount of data that can be entered (the maximum number of characters).

The Main Menu

The program begins with the Main Menu, which provides the following options:

- Add/Edit Project & Structure Inventory
- Modify/View/Delete Inspection Data
- Add Inspection Data
- Reports and Forms
- Database Administration
- Machine Configuration.

Add/Edit Project & Structure Inventory

This option is used for defining structure inventory. It allows the user to describe the location, dimensions, and general construction characteristics of the projects, the structures, and the reaches. This option also allows the user to edit already defined projects, structures, and reaches.

Modify/View/Delete Inspection Data

This option (to modify, view, or delete inspection data) is a supplement to **Add Inspection Data** and can only be used after inspection data has been entered. This option is also useful for quickly viewing calculated Condition Index values for individual reaches and their respective structures. The user should be careful, however, when choosing **Delete** as there is no retrieving feature to recover data after it is deleted.

Add Inspection Data

This option is used for entering inspection data. It can only be used after the project and structure inventory have been completely defined.

Reports and Forms

This option is used for obtaining reports and forms. **Reports** provides organized formats for viewing or printing inventory or inspection data, comments, missing information, structural and functional ratings, and the related calculated Condition Index values. **Forms** provides field inspection sheets that can have blank headings or be pre-labeled with the project, structure, reach, and inspection date headings.

Database Administration

This option is used for managing the program's databases. As with **Modify/View/Delete Inspection Data**, the user should be careful when using the delete mechanism in this option; once deleted, a database cannot be recovered.

Machine Configuration

This option is used for adjusting screen colors, printer options, and program sounds. It allows the user to create a comfortable setting for working with this program and provides printing options for various printers.

Manual and Program Conventions

Manual Convention

Throughout the manual it is assumed that most entries are actuated by pressing the **ENTER** key. Therefore, this step will not be shown in the manual. Any exceptions will be noted.

Program Conventions

The following conventions are used with BREAKWATER:

1. The box at the bottom of the screen is the key information box. Available keys and their functions are noted in that box.
2. Most data fields must be completed to allow the program to calculate condition indexes; optional data fields are usually apparent.
3. Incomplete data sets may be saved.
4. The **F10 (Done)** key:
    - May be used at any time during the operation of the program.
    - During data entry and modification the **F10** key will prompt the user to **Save the data and return, Abort the data and return,** or **Continue editing the current data set.** Upon completion of the **Save** or **Abort**, the system returns the user to the previous screen.
    - At non-data entry and modification screens, the **F10** key simply returns the user to the previous screen.

Program Operation Keys: Functions and Conventions

The Three Operation Key Types

There are three types of keys available for use throughout BREAKWATER:

1. Data Entry Keys
2. Editing Keys
3. Specialty Keys

The functions of each type are discussed below:

Data Entry Keys

The data entry sections of BREAKWATER use a number of keys for cursor movement, data selection, and special functions. The system employs two different methods for data entry. The first involves selection of data from a pop-up menu **(Type 1)**. The second requires the user to key in the data **(Type 2)**. Key availability and function is displayed in a box at the bottom of the screen.

Key Name	Symbol	Function	
Enter Key	**[ENTER]**	Accepts the data and moves cursor to the next data field.	
Home Key	**Home**	Places cursor on the first data entry field.	
End Key	**End**	Places cursor on the last data entry field.	
Up Arrow Key	↑	**Type 1:**	Moves the highlight bar up one menu option.
		Type 2:	Places the cursor on the data entry field above the current field.
Down Arrow Key	↓	**Type 1:**	Moves the highlight bar down one menu option.
		Type 2:	Places the cursor on the data entry field below the current field.
Right Arrow Key	→	**Type 1:**	Moves the highlight bar down or to the right one menu option.
		Type 2:	Places the cursor on the next data entry field.
Left Arrow Key	←	**Type 1:**	Moves the highlight bar up or to the left one menu option.
		Type 2:	Places the cursor on the previous data entry field.
F1 Key	**F1**	Displays help screen.	
F2 Key	**F2**	Functions as a Type 2 up arrow key, and a Type 1 and Type 2 entry only on those screens that apply.	
F3 Key	**F3**	Functions as a Type 2 down arrow key, and a Type 1 and Type 2 entry only on those screens that apply.	
F10 Key	**F10**	F10 always exits the current process and returns the user to the previous one.	

Editing Keys

The following editing keys are used mainly when making changes to the data already entered into the program:

Key Name	Symbol	Function
Backspace Key	←	Backward one space (erases characters as it moves)
Delete Key	**DEL**	Deletes the character at the cursor position
Insert Key	**INS**	Toggles the Insert Mode on / off
Left Arrow Key	←	Backward one space (moves without erasing characters)
Right Arrow Key	→	Forward one space (moves without erasing characters)

Specialty Keys

Function Keys **F2, F3** and **F4** perform different actions at different locations in the system. During the editing process they function as described above. At other times the actions are listed at the bottom of the screen in the key box.

Program Help: The F1 Key

Program Help was created for user convenience, and supports most screens in the BREAKWA-TER program. When activated, the F1 Key provides the user with a description of the high-lighted option displayed on the current screen. If F1 Help is activated on a menu screen, such as the main menu of the program, it will remain on until an option is chosen. This allows the user to scroll down the menu to see a description of each option.

If a screen is not supported by F1 help, then pressing the F1 key defaults to the system help box. The system help box gives a listing of the Breakwater and computer program definitions. In addition to the definitions, the system help provides tutorials on the major procedures for inventory and inspection. The user may want to skim the system help box and review the provided tutorials for brief step by step procedures on how to input data into this system.

Using a Mouse

The mouse acts as a supplement to the keyboard, and can be used in almost all of the screens. The mouse has the same point and click features in this program as all other Windows type programs. However, the cursor for the mouse will not be an arrow like most windows programs, but rather a block that takes up the space of one character. Like other Windows-type programs,

you are able to point anywhere in a screen and click to insert your entry or select a menu option. In some screens, however, the mouse is not activated.

Multiple Program Operation

Due to the origination and development as a DOS based program, Breakwater is best run with few or no resident programs open. Lack of memory might cause the BREAKWATER program to produce a fatal error if too many other computer programs are being run at the same time.

3 Program Installation and Setup

Introduction

This chapter will explain the steps required prior to entering data into BREAKWATER. The following topics will be covered:

- Hardware Requirements
- Computer Configuration
- Installing BREAKWATER
- Starting BREAKWATER
- BREAKWATER Setup Options.

Hardware Requirements

BREAKWATER was developed for operation on an IBM (™International Business Machines Corp.) compatible personal computer that runs at least MS-DOS 3.3 (™Microsoft Corp.). A hard disk drive is required with a recommended 20 megabytes or higher free storage capacity. 4 megabytes of Extended Memory is required to run this version of the program. 640K RAM memory is also required.

If the computer has memory resident utilities such as Sidekick or PC Tools loaded into memory, they may need to be unloaded before BREAKWATER can be run.

If BREAKWATER is to be run on an older (slower) PC, a system for disk caching is highly recommended. There are many utilities, shareware and otherwise, available which can improve disk performance substantially. We warrant no caching system to perform with this program other than SMARTDRIVE.

Computer Configuration

A file called CONFIG.SYS must be present in the root directory of the PC with the following commands for this program to run properly.

BUFFERS =25
FILES = 25

The CONFIG.SYS file can be detected by typing **DIR CONFIG.SYS** in the root directory. If the file exists, the PC will list the file name, size and date created. If you do not have a CONFIG. SYS file, use a text editor (not a word processor unless the information can be saved in text format) to create one with the above commands. Place the file in the root directory of the PC. After creating a new CONFIG.SYS, restart the PC **(CTRL-ALT-DEL).** To ensure that the PC has at least 640K of available RAM memory, type the command **CHKDSK** at the C:\> prompt to receive a disk and memory status report. The last two lines displayed on the screen should read:

BYTES TOTAL MEMORY
BYTES FREE

The number of bytes total memory should be at or near 640K. The number of bytes free should be near 511K or greater. If it is not, check for the presence of a memory resident utility. For further explanation concerning CONFIG.SYS, BUFFERS, and FILES commands, consult a DOS manual.

Installing BREAKWATER

BREAKWATER will be supplied on floppy disk. All the files will be copied onto the local hard drive when the program is installed. A summary of the install procedure follows (while in DOS):

1. Insert the floppy disk labeled **Disk #1** into the PC's A: drive.
2. Type **A:install** at the C:\>prompt.
3. Follow the instructions displayed on the screen. Choose **BRKWATR** as your subdirectory.

When the install process is complete BREAKWATER is on your local hard drive in a directory called **BRKWATR**, as you have chosen**.**

Starting BREAKWATER

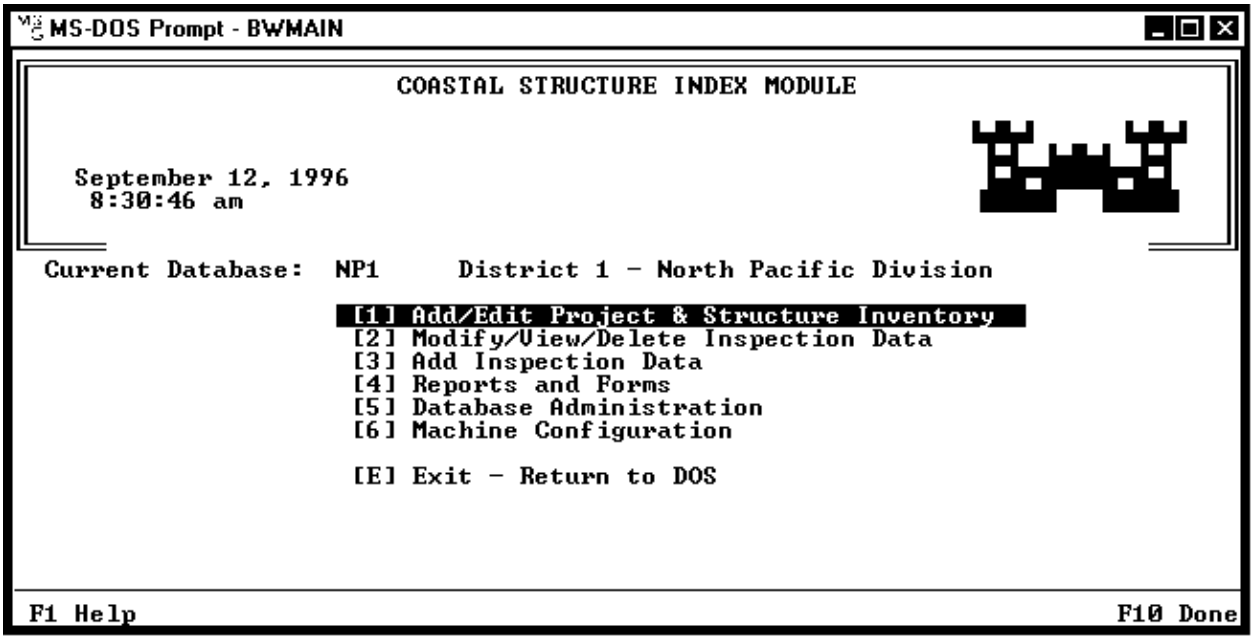
When you are ready to access BREAKWATER, you must be in the **BRKWATR** directory.

1. Access the BREAKWATER directory. At the system prompt type:
   C:\>**CD BRKWATR**
2. Type the command **BWMAIN** after the system prompt.
   C:**BRKWATR**>

The first BREAKWATER screen will now appear.

BREAKWATER Setup Options

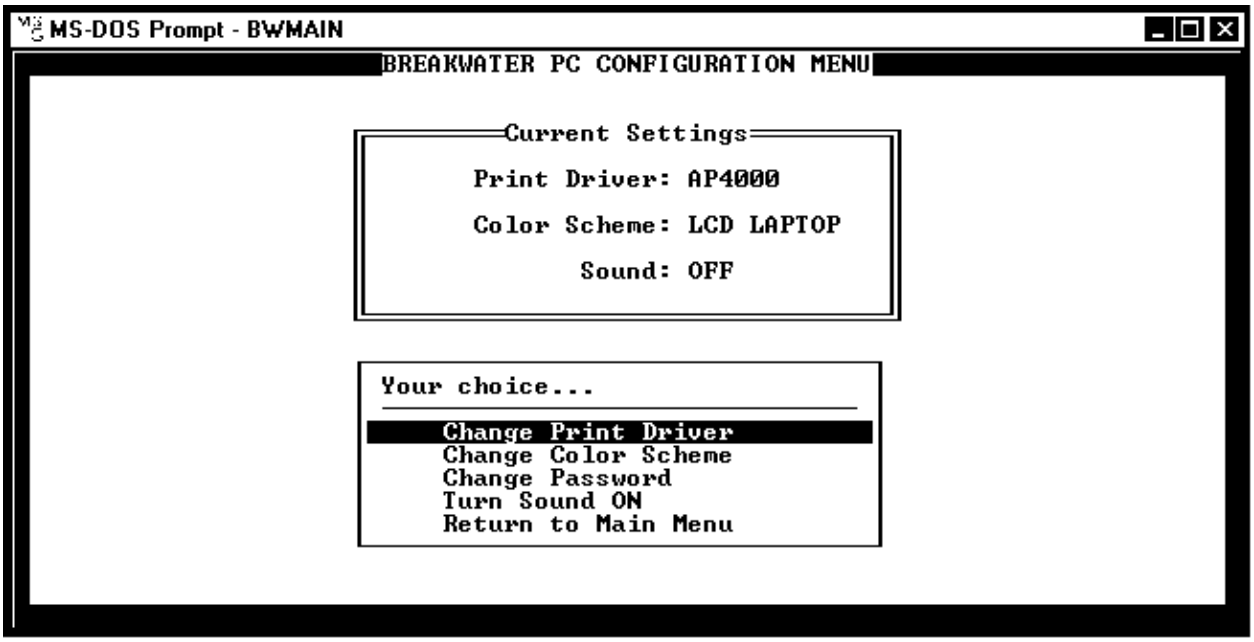
After BREAKWATER is invoked with the command C:\BRKWATR> **BWMAIN**, and a password is given, the main menu is displayed. All options begin at this menu.



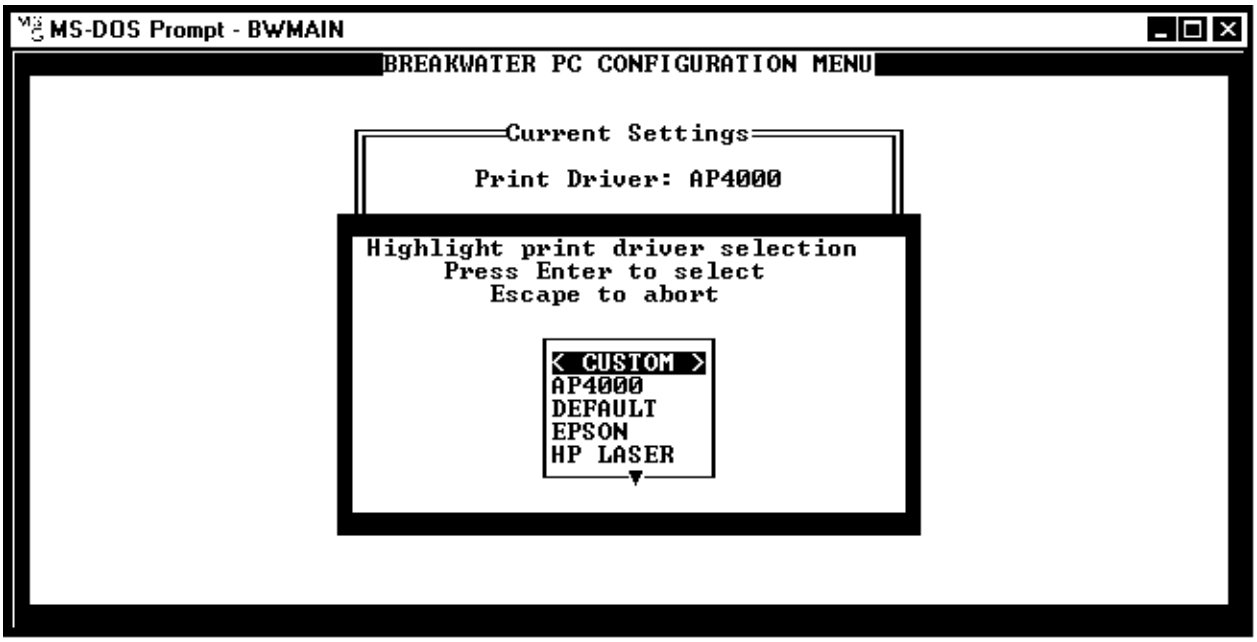
Program Configuration

When using BREAKWATER on a color monitor, the ability to specify foreground and background colors, as well as printer types has been provided in the **Machine Configuration**, option 6, from the main menu. The machine configuration option provides a menu driven method for the user to modify the default settings for a number of different display characteristics. When the Machine Configuration Menu of each new selection is displayed, the current setting is shown as the default.

•Breakwater PC Configuration Menu



•Printer Configuration Menu



The system must be configured for the proper printer to print the reports and forms. BREAKWATER provides the parameters for six predefined printers. These are: HP LaserJet, Epson, Null, AP4000, Okidata, and an IBM printer. If the appropriate printer is not available in the above listing, a fifth option, **CUSTOM** is provided. When selecting **CUSTOM** the user must supply the system with two pieces of information about the printer. First, a user defined printer name is necessary for reference by the program (i.e., 'IBM PROPRINTER'). Second, you must enter the printer codes manually. See your Printer Operating Manual for instructions on how to do this.

- **Screen Configuration**

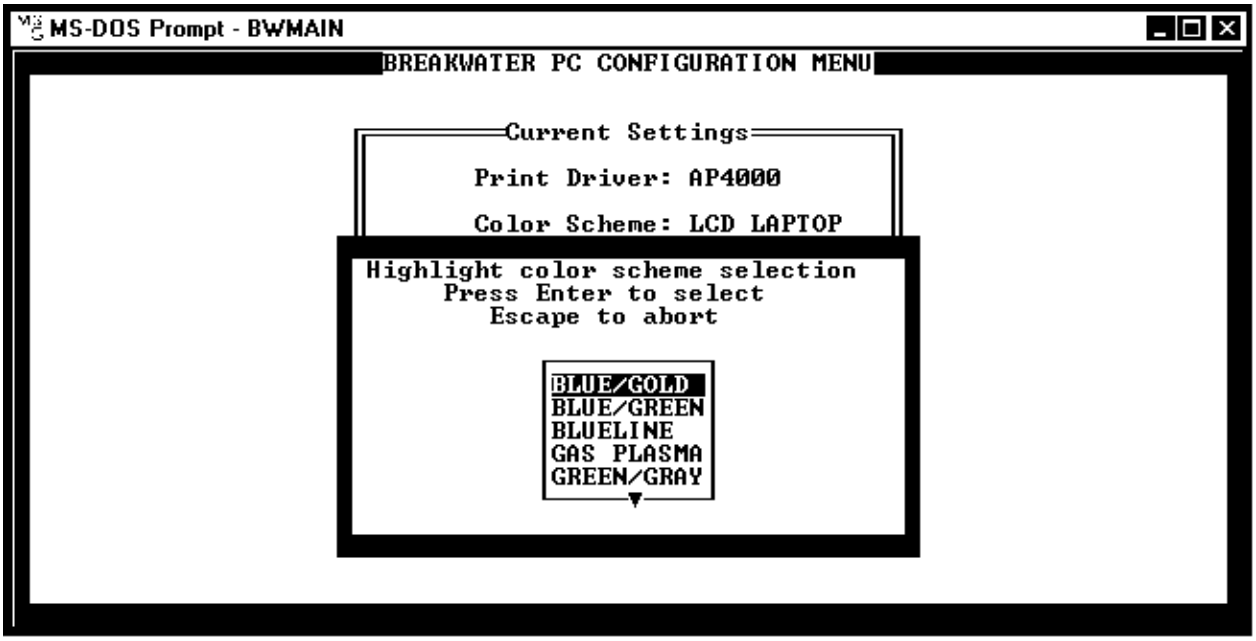
The system has the ability to work with color or monochrome screens. These can be selected via the screen configuration menu.

- **Screen Colors**

The foreground and background colors may be specified for the following displays: titles, boxes, text, highlighted text, error messages, pop-up boxes, triggers, data, highlight (menu) bars, and fields. The possible color choices are selected from a menu. They are: Blue/Gold, Blue/Green, Blueline, Gas Plasma, Green/Gray, LCD Laptop, Monochrome, and Rainbow. The user should try out each color scheme to see which one is the most preferable.

The arrow keys are used to maneuver the menu bar over the desired color scheme, and the carriage return is used to select it. Also, the user is able to select any color scheme by clicking on it with the left mouse button. As the colors are changed the main selection menu acts as a

sample box, and reflects the user's new choices. Upon completion, the new colors may be stored by pressing the **F10** key and answering **Y** to the store changes prompt. From this point forward the Coastal Structure Module will reflect the new colors chosen by the user.



4 Inventory

Introduction

Inventory information defines the projects and structures within the program database. This information must be entered before any inspection data can accepted by the program. Inventory is divided into these three types of data:

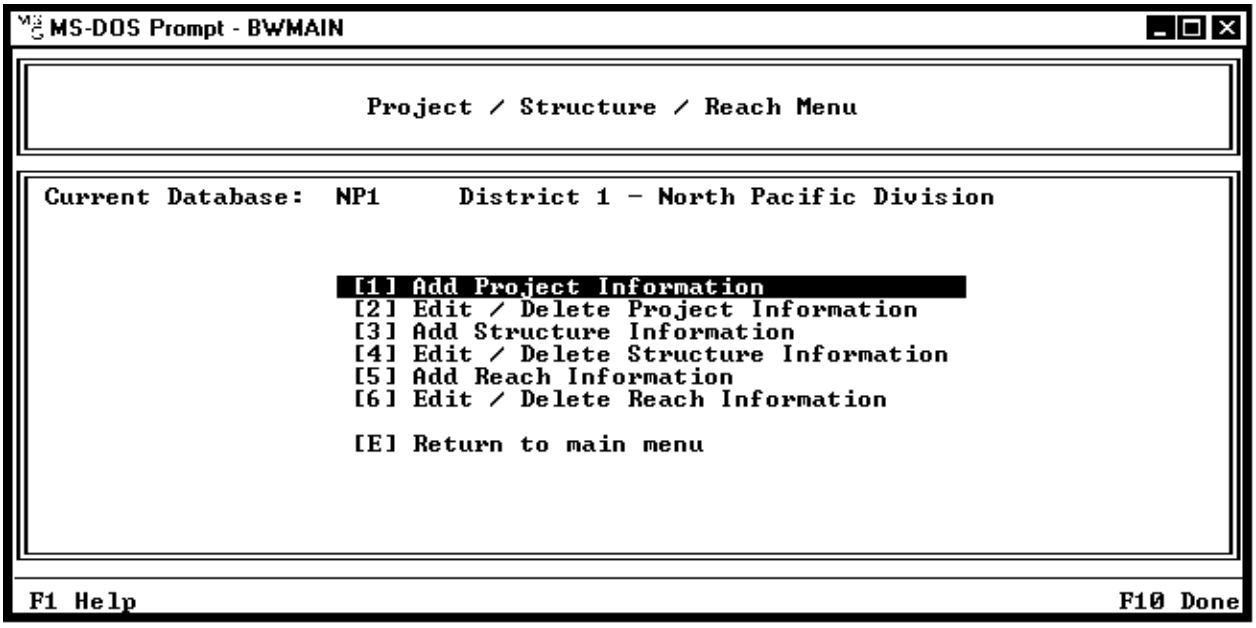
- **Project Data**
- **Structure Data**
- **Reach Data**

Defining a Project

To add (define) a project:

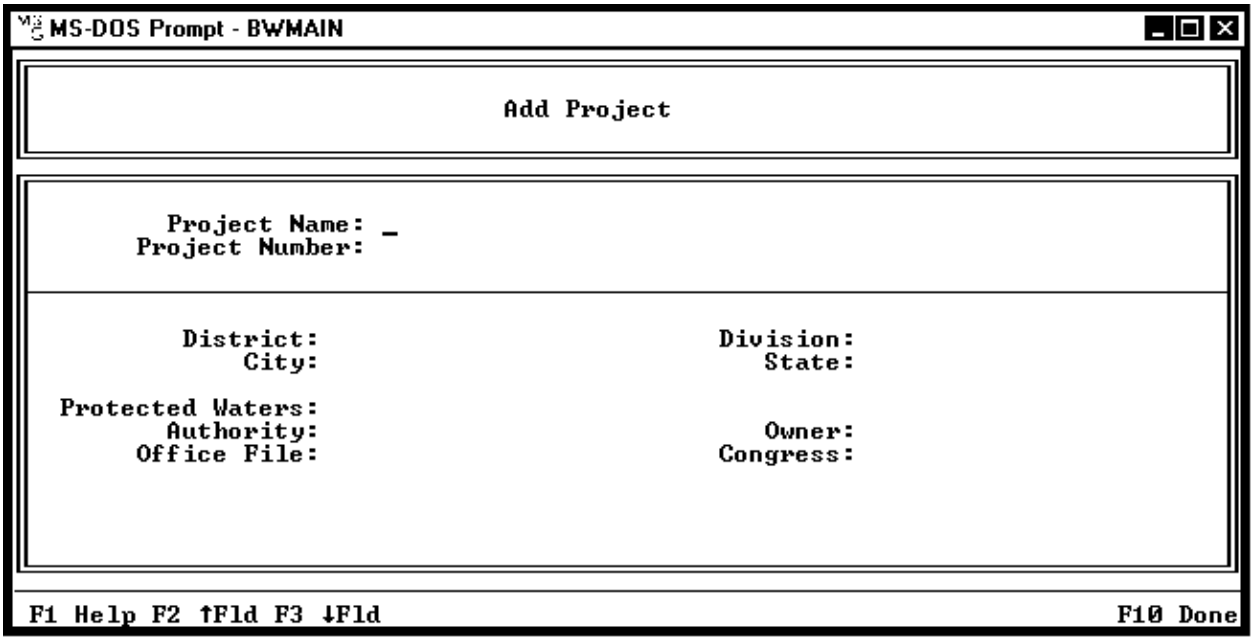
- Select **Add/Edit Project & Structure Inventory**, option 1, from the Main Menu.

The following screen will appear—the Project/Structure/Reach Menu.



- Select **Add Project Information**, Option 1.

The **Add Project** screen will appear.



The following data should be entered for each project:

Project Name: Name of project. It is the name under which the structures are listed.

Project Number: The number that corresponds to the project and distinguishes it from other projects.

District: The USACE district where the project is located.

Division: A three-letter abbreviation of the division where the project is located. (i.e. SPD - South Pacific Division).

City: The city where the structure is located.

State: The state where the structure is located.

Protected Waters: The body of water that the structure is protecting: harbor, channel, etc.

Authority: The legislative authority that led to the construction and maintenance of the project.

Owner: The owner of the project may be a public or government agency.

Office File: The number that corresponds to an office file of the project.

Congress: The congressional district where the project is located. This field has two parts. The first part is automatically entered by BREAKWATER and is the two-letter state abbreviation supplied in the State field. The second part is a three digit number. This number is user-supplied.

The following keys can be used to move the cursor on the screen:

Arrow Keys	Move the cursor from field to field around the screen.
Home/End	Moves the cursor to the first / last field on the screen.
F2	Acts the same as the up arrow key.
F3	Acts the same as the down arrow key.

After entering the Congressional District Number, BREAKWATER will automatically save the record if all the information was entered correctly. If data is missing in the **Project Name** field or the **Project Number** field or both, a warning box pops up and the user is allowed to go back and enter the missing information.

If **F10** is pressed before the Congressional District Number is entered, a box pops up and asks whether to **(A)ccept**, **(M)odify** or **(E)xit**. **Exit** will stop and not save the current data. **Modify** will allow editing of the current data, and/or additional data to be entered. **Accept** will record the current entry and return to the previous menu.

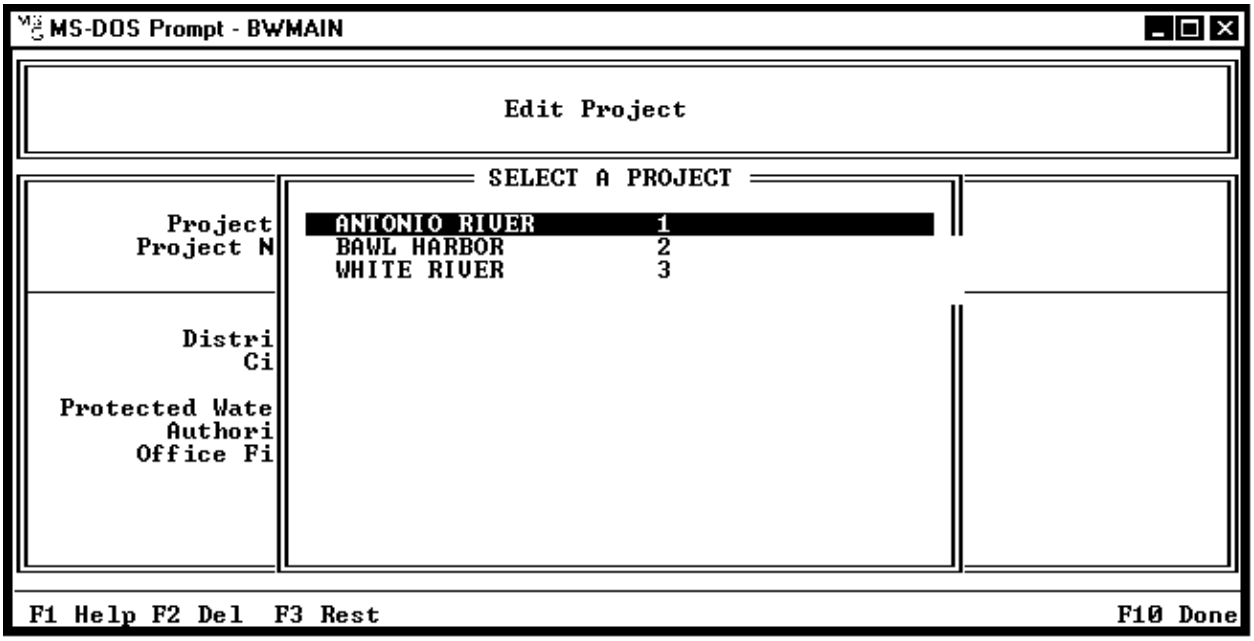
Editing/Deleting a Project

To Edit a Project

- Select **Add/Edit Project & Structure Inventory**, option 1, from the Main Menu.

- Select **Edit/Delete Project Information**, option 2, from the Project/Structure/Reach Menu.

The **Select a Project to Edit** screen will appear.



After a short pause, a large bounce-bar menu appears within a box labeled **Select a Project**. Inside the box is the list of projects that have been defined. The **project** in the **top** row is highlighted. The arrow keys will move the highlight bar **up** or **down** as desired.

The list can be longer than that shown on the screen. The page down **(PGDN)** and page up **(PGUP)** keys may be used to flip to the next (or previous) screen.

Press **[ENTER]** to select the highlighted record for editing. At this point the user is ready to edit a previously defined project. The data entry screen will appear with the previously entered data next to the field names. The user may now step through each field in the same manner as when originally entered.

One exception is at the last field, **Congress**. The **[ENTER]** key will complete this entry and prompt the user with a small box to **Save Record (Y/N)**? After answering appropriately, the screen stays in the edit mode. **F10** can also be used to indicate that the user is done editing the screen. When **F10** is pressed the user will get an **Accept, Modify, or Exit** pop-up box. If no changes were made to the project record, the user will be returned to the previous menu after hitting **F10.**

To Delete a Project

From the **Select a Project to Edit** box, pressing **F2** for a highlighted project will mark that project for deletion. After pressing **F2**, the user is asked to confirm the deletion, by answering the prompt:

<<No>> <Yes>

By pressing **Y** the user confirms the removal of the project data. The **N** key will abort the command and not delete the data. The user will be returned to the **Select a Project** box and can proceed to mark other records for deletion.

The user should note that records marked for deletion are denoted with a **"D"** to the left of the **Project Name**. Pressing **F3** while the highlight bar is on a marked record will restore the record from deletion. The user is asked to confirm the restore with a **<<No>> <Yes>** prompt. Records can be marked and unmarked for deletion as often as desired before the **F10** key is pressed.

The **F10** key is used to signal that the user is done and the message "**packing ....**" appears briefly on the screen. The program returns to the previous menu.

NOTE: **When records are marked for deletion, if the user attempts to edit a record by pressing the [ENTER] key the records will be permanently deleted, just as though F10 had been pressed.**

Defining a Structure

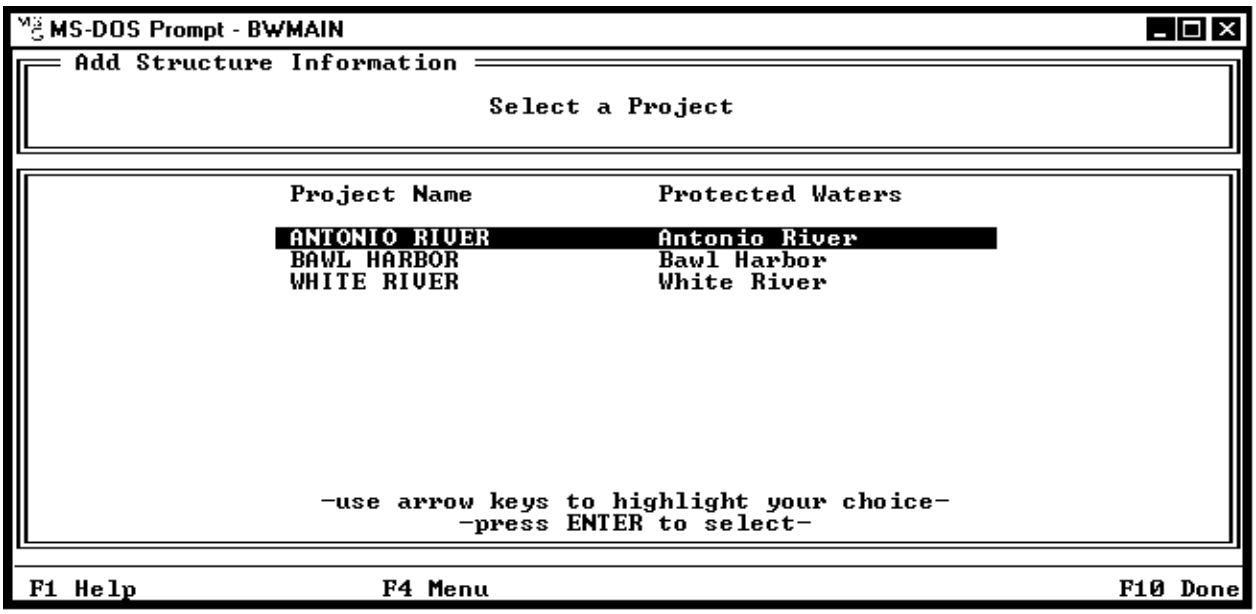
To add (define) a structure

- Select **Add/Edit Project & Structure Inventory**, option 1, from the Main Menu.

The screen that appears is the Project/Structure/Reach Menu, shown under the **Defining a Project** section earlier in this chapter.

- Select **Add Structure Information**, option 3, from the Project/Structure/Reach Menu.

The **Select a Project** screen will appear enabling the user to select a project under which to add a structure.



Use the arrow keys to highlight a **Coastal Project**.

- Press **[ENTER]** to select a project.

(Note: If the user decides not to add a project at this time, pressing **F4** will return to the previous menu).

The **Add Structure** data entry screen will then appear. The following data should be entered for each structure:

Structure Name: The name corresponding to the structure.
Total Length: The total length of the structure to the nearest foot.
Structure Intent: The purpose of the structure.
Year Completed: The year that the structure was completed and fully operational.
Structure Type: Pick one: Breakwater or Jetty.
Connection Type: Pick one: Shore-connected or Offshore.
Structural Elevs.: Pick one: Overtopping or Nonovertopping.
Armor - Crest: The type of material of which the crest / cap is composed.
Armor - Sea Side: The type of material of which the seaside slope of the structure is composed.
Armor - Channel/ Harbor Side: The type of material of which the channel/harbor side slope of the structure is composed.
Foundation: The type of material of which the foundation of the structure is composed.
Crest Width: The total width of the crest to the nearest foot.
Auxiliary: The auxiliary structures that exist on the structure. (i.e. navigation lights, hand railing, etc.)

Head Reach: The designation or label to indicate which reach is a structure head. (an offshore breakwater typically will have two head reaches)

The structure type fields are each filled in with a pop-up menu that appears with the appropriate options available. To select, use the arrow keys to highlight the proper choice and press **[ENTER]**. For the index calculations to be done properly, the system requires the following fields be filled in: **Structure Name**, **Breakwater/Jetty**, and **Total Length**.

NOTE: **The Structure Name field must be completed. If left blank, a pop-up box will give a warning message, and the user is then returned to editing that structure.**

- Press **F10** when done entering structures. A pop-up box will then appear with the choices **[A]**ccept, **[M]**odify, or **[E]**xit. Choose **Accept**, or hit return on the last data field and all of your input will automatically be retained.

Editing and Deleting a Structure

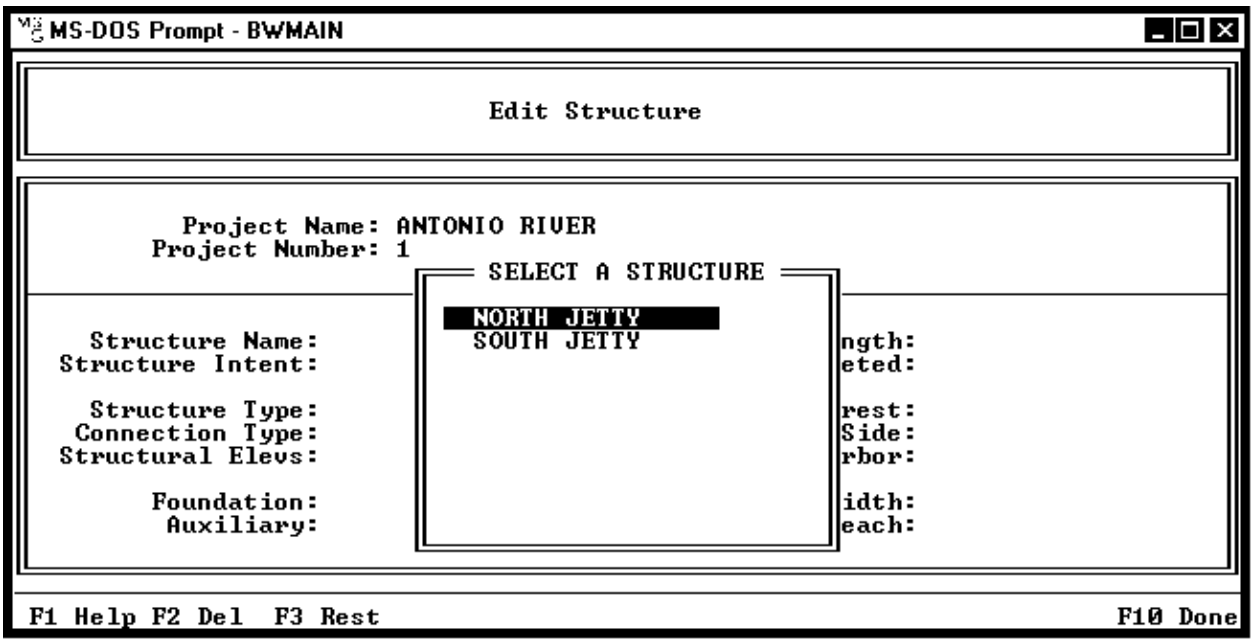
To Edit a Structure

- Select **Add/Edit Project & Structure Inventory**, option 1, from the Main Menu.

- Select **Edit / Delete Structure Information**, option 4, from the Project/Structure/Reach Menu.

- Select a project, same as when Adding a Structure.

A box will appear that lists the structures under the selected project. Use the arrow keys to highlight a structure and press **[ENTER]**.



- The system will then display the current data for editing.

- If **F10** is pressed when the cursor is at any field on the screen after entering data, the user will be prompted to **[A]**ccept, **[M]**odify or **[E]**xit the record. Choose **Accept**. Entering data consists of pressing the **[ENTER]** key when completing a data field.

To Delete a Structure

Follow the same procedures as for editing a structure. At the **Select a Structure** box, use the **F2** key to mark that structure for deletion. The deletion procedure works the same as when deleting a project. See the Deleting a Project section earlier in this chapter for more details.

Defining a Reach

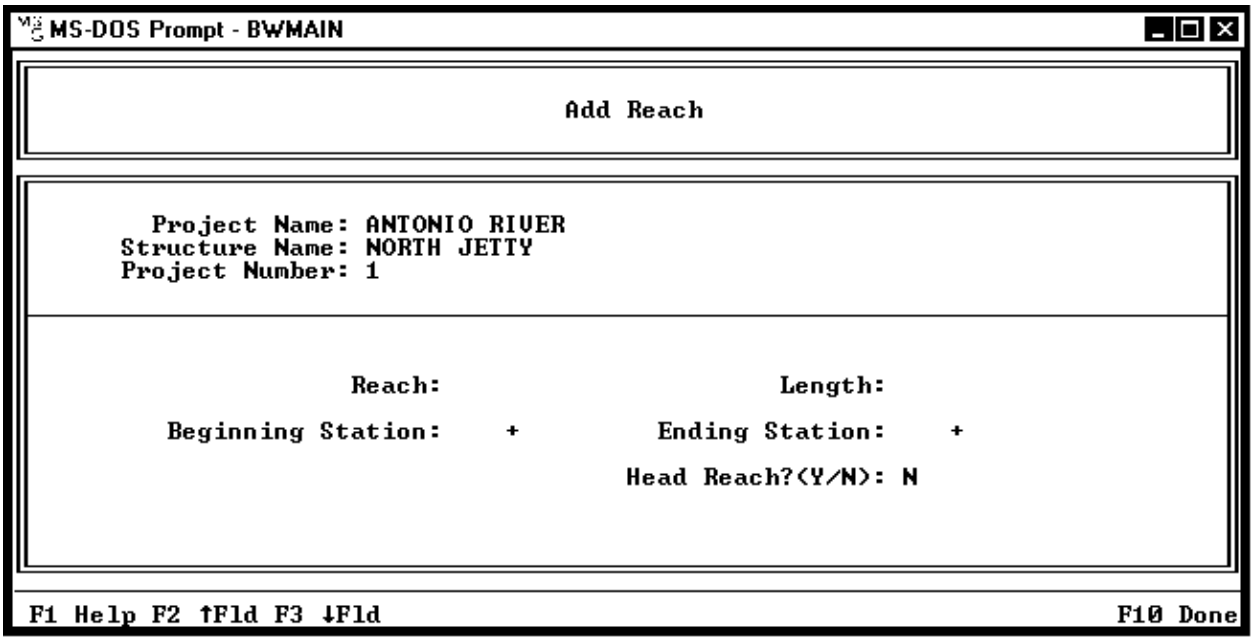
To Add a Reach

- Select **Add/Edit Project & Structure Inventory**, option 1, from the Main Menu.

- Select **Add Reach**, option 5, from the Project/Structure/Reach Menu.

As for adding a structure, the user must first select a project in which to add a reach. Use the arrow keys to highlight the project and press **[ENTER]** to select. After selecting a project, the user must select a structure under which to define a reach. The **Select a Structure** screen is very similar to the **Select a Project** screen. Use the arrow keys to highlight the desired structure and

press **[ENTER]** to select. After selecting a structure the **Add Reach** screen is available for data entry.



The following data should be entered for each reach:

Reach:	The reach designation (reach number).
Length:	The length of the reach in feet.
Beginning Station:	The surveyor's station number at the start of the reach. (i.e. 25+04 represents 2504 ft. - from the beginning of the structure).
Ending Station:	The surveyor's station number at the end of the reach.
Head Reach?(Y/N):	If the reach is a head reach, answer [Y] for yes, otherwise, [N]

After data entry for the reach is complete, the user is able to continue adding reaches under the selected project and structure.

- Press **F10** when finished adding reaches. The program then returns to the **Select a Structure** screen which must be selected to add more reaches under a different structure. Press **F10** to return to **Selecting a Project**. Press **F10** one more time to return to the Project/Structure/Reach Menu.

Editing/Deleting a Reach

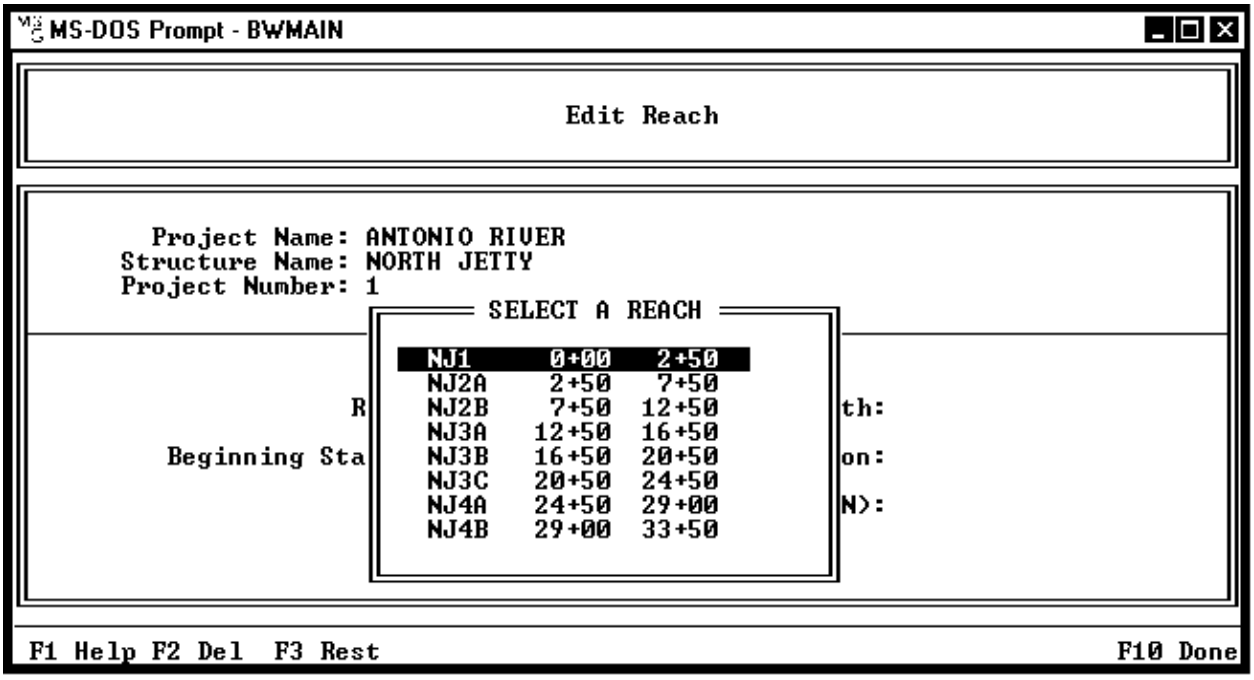
To Edit a Reach

- Select **Add/Edit Project & Structure Inventory**, option 1, from the Main Menu.

- Select **Edit/Delete Reach**, option 6, from the Project/Structure/Reach Menu.

As for adding a reach, the user must select a **project** and a **structure**. If no reaches have been defined for the selected project and structure, a pop-up box will appear and the user will be able to select another structure. A similar pop-up box will appear if no structures have been defined under the selected project. The user may then select another project.

After a project and a structure have been selected, the **Select a Reach** box will pop up, as shown in the sample screen below.



Use the **UP** arrow and **DOWN** arrow to highlight the desired reach, then press **[ENTER]** to select. Reaches are listed by their name,and beginning and ending stations.

After selecting a reach, the user can edit the data that defines the reach by using the arrow keys and the **F2** and **F3** keys to navigate the screen. Pressing the **UP** arrow when on the first field will scroll to the previous reach, which can then be edited. Pressing the **DOWN** arrow when on the last field will scroll to the following reach, which can then be edited.

If **F10** is pressed when the cursor is at any field on the screen after entering data, the user will be prompted to **[A]**ccept, **[M]**odify or **[E]**xit the record. Choose **Accept** to save the edited data. Entering data into the program occurs when the **[ENTER]** key is pressed after completing a data field. After saving the changes, the program returns the user to **Project/Structure/Reach Menu**.

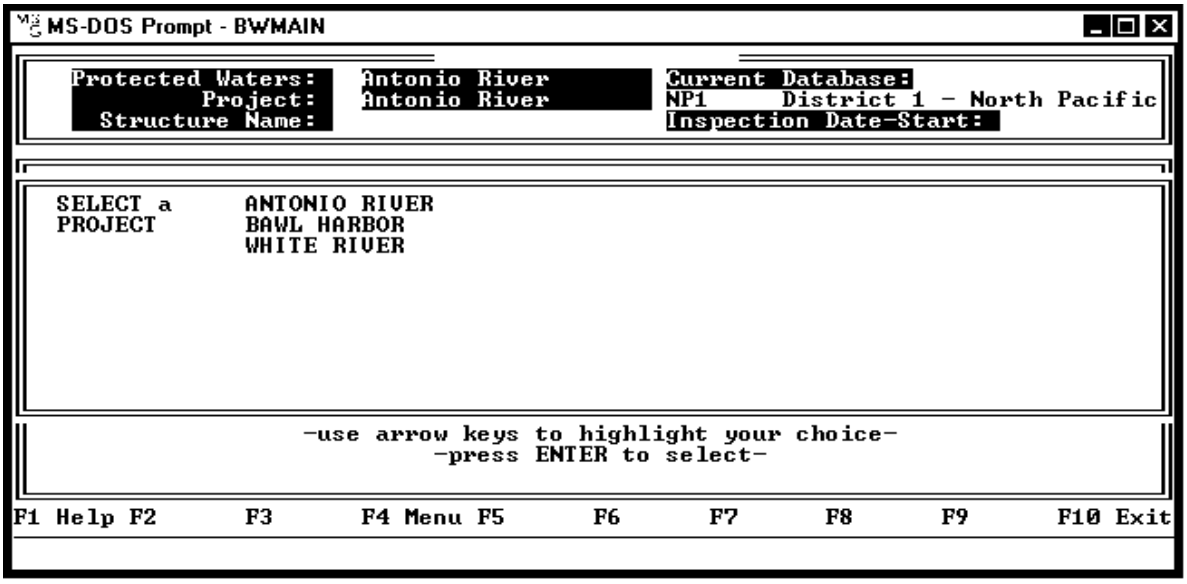
To Delete a Reach

Follow the same path as for editing a reach, up to the **Select a Reach** box. At this point, the **F2** key can be used to toggle to the choice for deleting a reach. For more details, see the **Deleting a Project** section in this chapter.

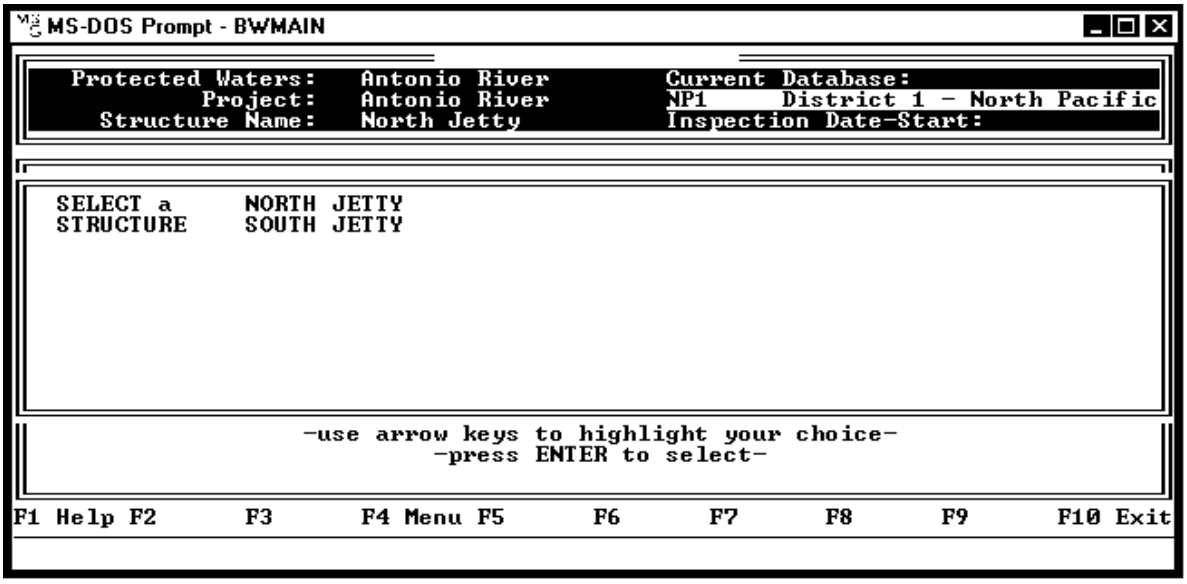
5 Inspection

Adding Inspection Data

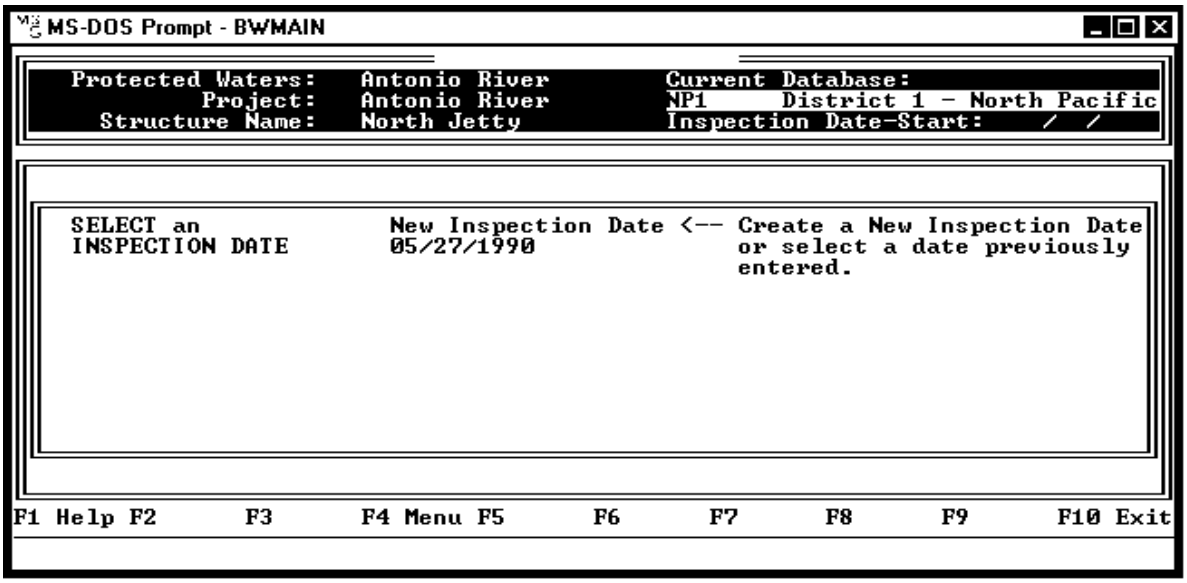
The process of adding **Inspection Data** begins at the Main Menu. Select option 3, **Add Inspection Data**, and a list of coastal projects is presented:



Using the arrow keys, highlight the project to be selected and press **[ENTER]**. The user will then be presented with the structures associated with that project:



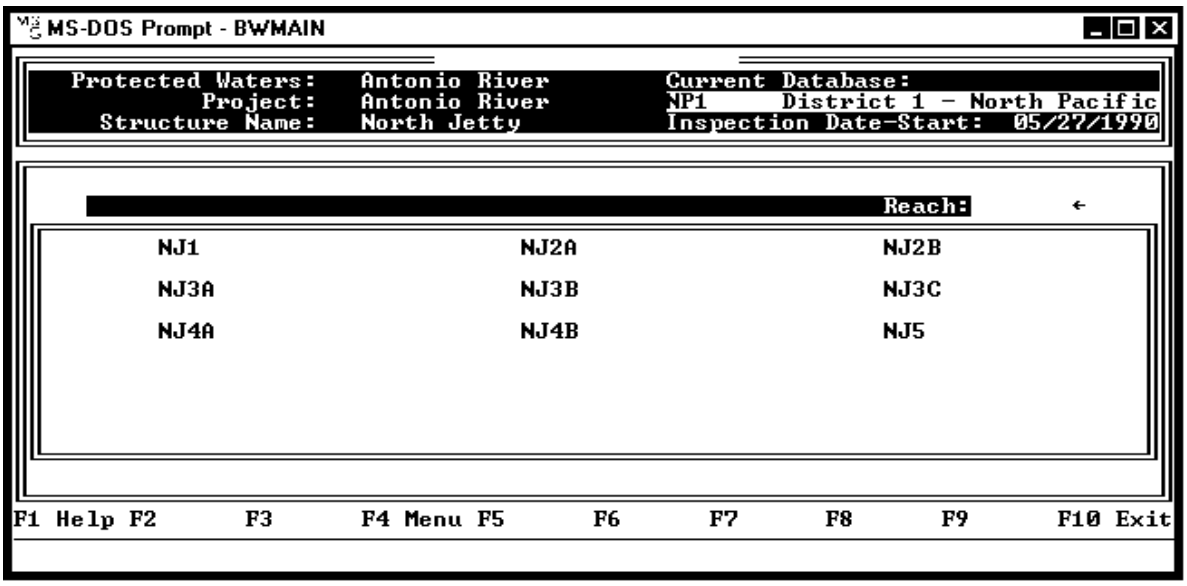
The list may be longer than what is shown on the screen. The page down **(PGDN)** and page up **(PGUP)** keys may be used to see the next (or previous) screen. Highlight the desired structure and press **[ENTER]**. The screen will then show dates for inspections that have been recorded for that structure:



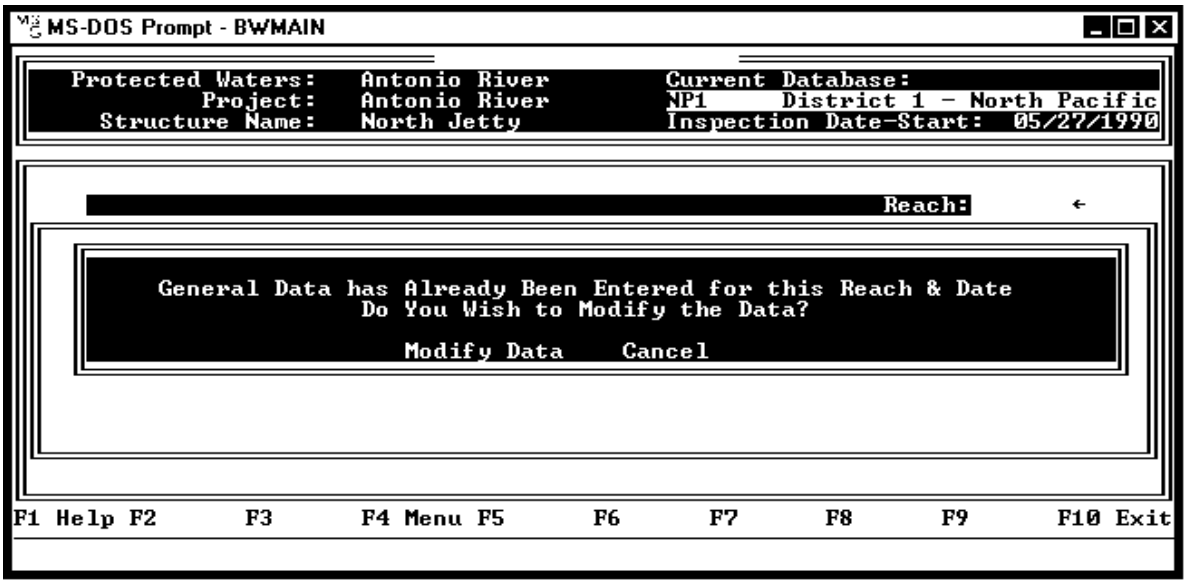
With the arrow keys, the user may select one of the dates shown or enter a new inspection date by selecting **New Inspection Date.**

NOTE: It is important for the user to enter the **Inspection Start Date** by structure and not by each individual reach. Use the date that the first reach was inspected as the date for inspection of all reaches within the structure, even if inspection of some reaches was not actually completed (or started) that day. Inspection data for the reaches will not be associated with a complete inspection of the structure if different dates are entered for each reach.

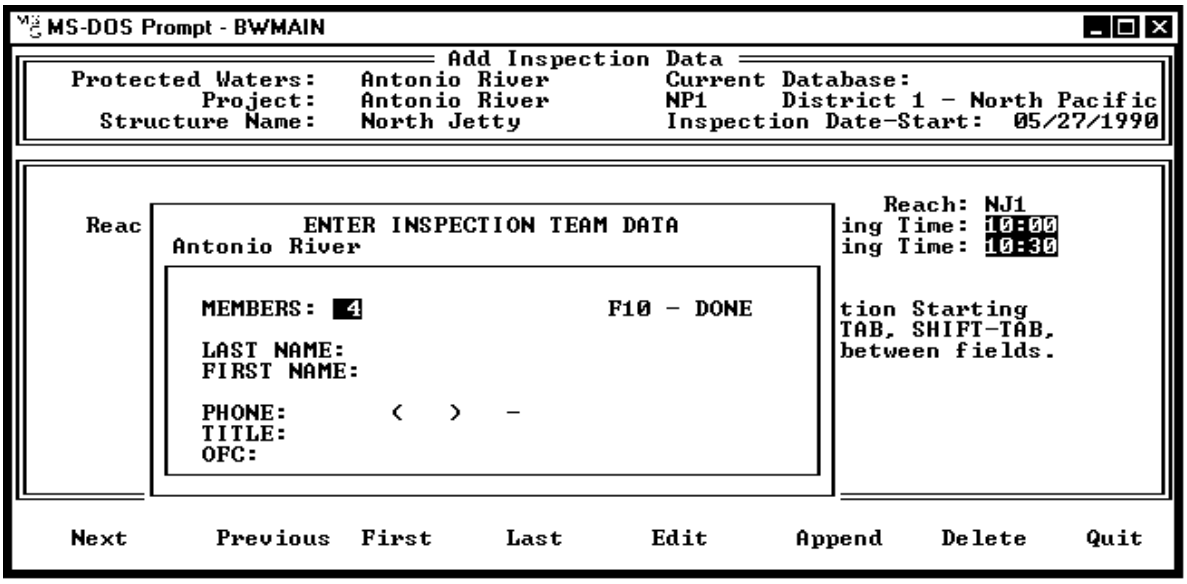
After the date is entered, a pop-up screen (as on the next page) gives the user the list of reaches within that structure. The user may scroll with the scroll keys to select a reach. The reaches were defined in option 1 (**Add/Edit Project & Structure Inventory**) in the Main Menu. **Note: Reaches must be defined before any inspection data for them can be entered.**



Inspection Date- Current and **Inspection Time** are entered next. This is the date and time that the **selected reach** is inspected. If data already exists for this date and structure, a message is displayed, offering the user an opportunity to modify the existing data:

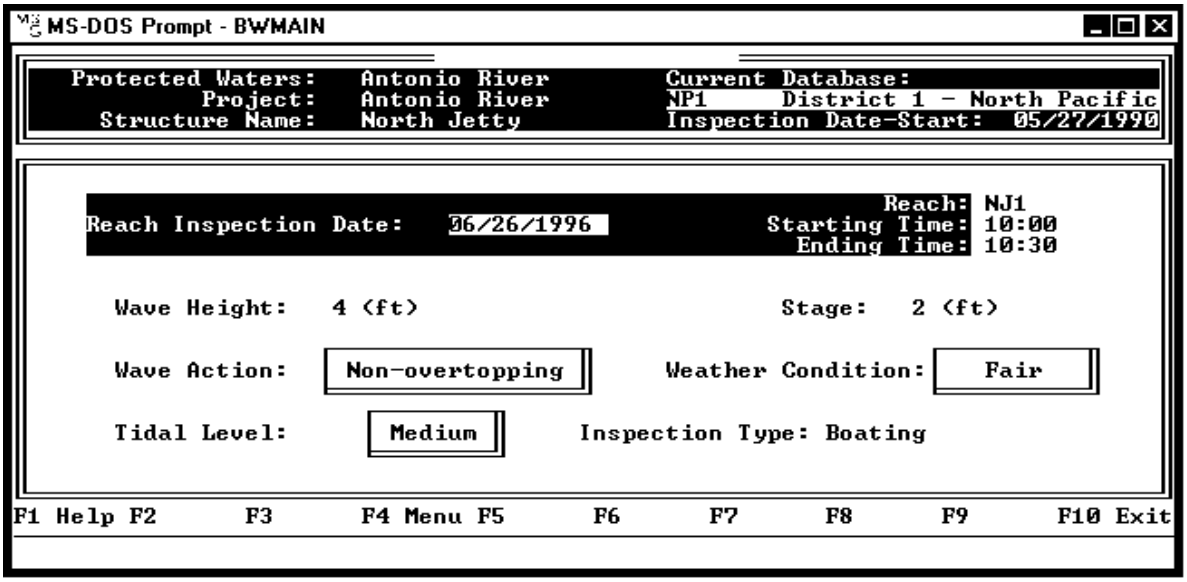


When the **Date** and **Time** are completed, the **Inspection Team Data** pop-up box is displayed. The team is a listing of the Inspectors, Addresses, and Office Symbols:



The menu at the bottom of the screen provides the capability to see additional **Team Data** that may exist for the structure. Highlight the **NEXT, PREVIOUS, FIRST** and **LAST** options to view the various records. To **EDIT, APPEND** and **DELETE** data, highlight the appropriate option and press **[ENTER].**

After the **Inspection Team Data** is completed, choose **Q** for **Quit**. The next screen allows you to input the **Sea and Weather Conditions on the day of the Inspection** for the selected reach. Highlight the appropriate condition and press **[ENTER]**, or input the appropriate values using the keyboard:



The **Inspection Type** field must be typed in by the user. These inspection types may include, but are not limited to, **walking** and **boating.**

Modifying Inspection Data

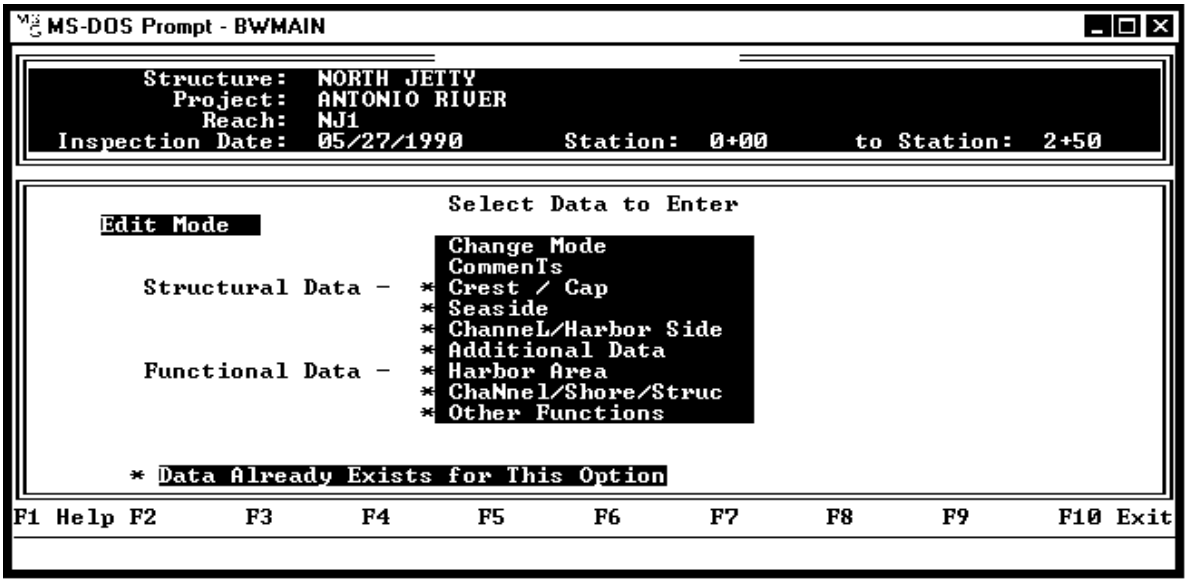
To begin the process of modifying inspection data**,** select **Modify/View/Delete Inspection Data** option 2, from the Main Menu. The following are selected from scrolling menus in this order:

- Project
- Structure
- Inspection Date
- Reach

After entering this data, the **Select Data to Enter** menu is presented. This will be discussed in the MODES Section.

Modes

Upon completion of adding or modifying inspection data, the **Select Data to Enter** menu is displayed:



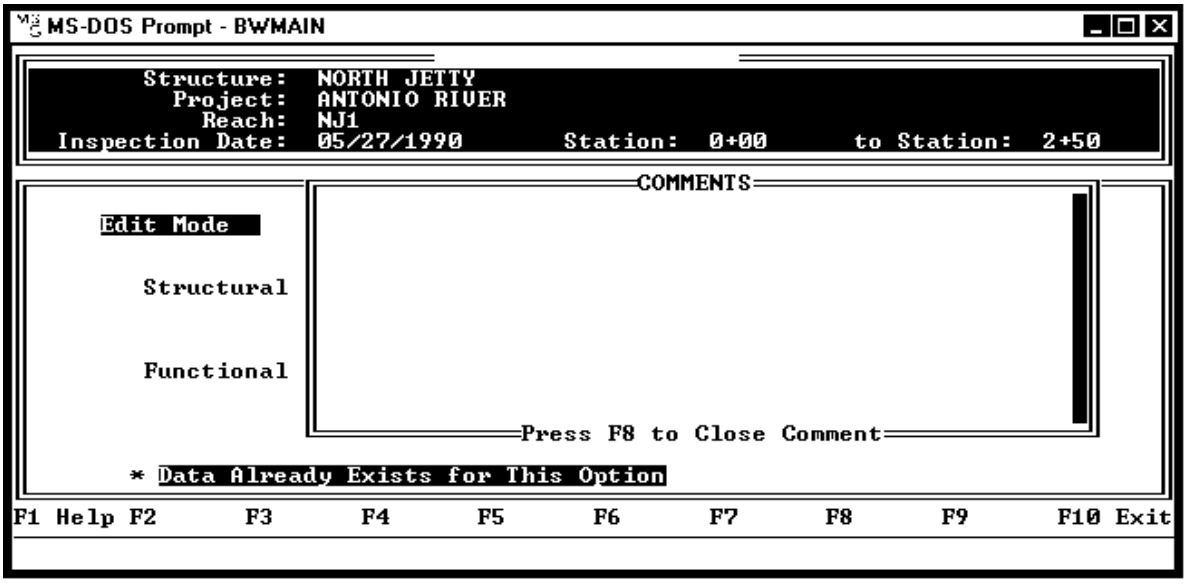
Change Modes

The manner in which the data is acted upon is executed through the **Change Modes** command. To activate this command, highlight **Change Mode** or press the trigger "**M**". Control is passed to the horizontal menu at the bottom of the screen. **Add Data, Edit Data, Delete Data,** and **View Data** are the selections. These choices have the following functions:

1. **Add Data** The information the user enters is added to the database.
2. **Edit Data** The information is retrieved from the database for the user to modify.
3. **Delete Data** All the information is erased from the database.
4. **View Data** The information is retrieved from the database for the user to view (but not change).

Comments

The feature, **Comments,** which is found in the **Select Data to Enter** menu, allows the user to make general comments about a reach. A document of overall comments for a specific reach can be created and edited. After selecting **Comments** from the **Select Data to Enter** menu, a box will appear titled **COMMENTS**. The user must press **F8** to close the comment box. The comment box is displayed below.



Structural Data

Crest/Cap, Seaside (or Head) and Channel/Harborside Selections

Each section, **Crest/Cap, Seaside** and **Channel/Harborside,** potentially can display the following types of distress:

Breach (for Crest/Cap only)
Core (or Underlayer) Exposure or Loss
Armor Loss
Loss of Armor Contact or Interlock
Armor Quality Defects
Slope Defects (Not Used for Crest/Cap)

Each distress type (rating category) is further defined by:

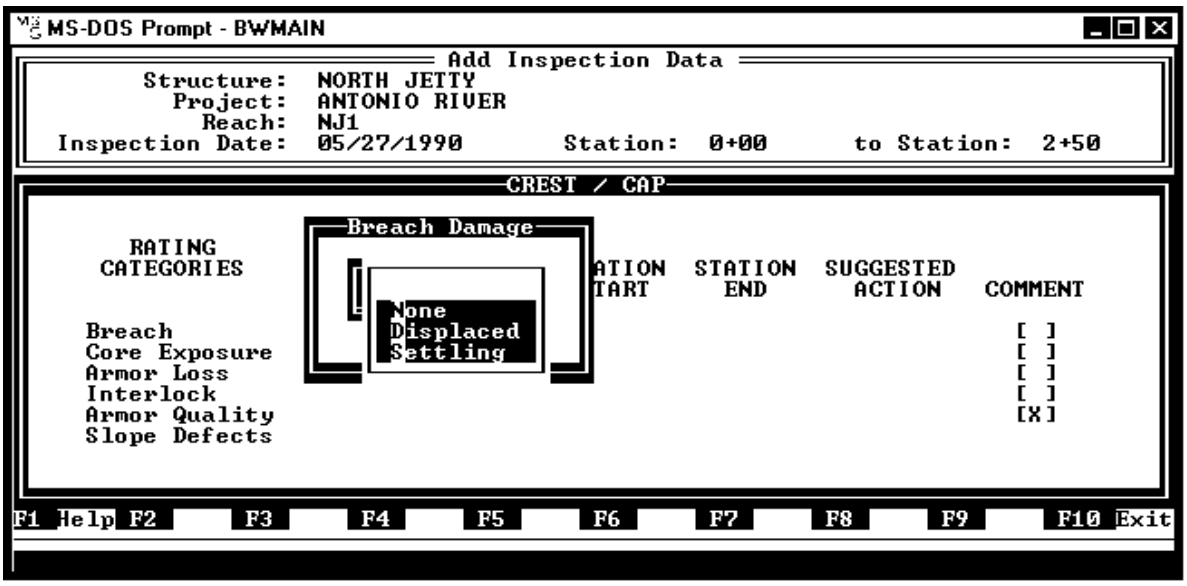
Recommended Action
Defect Type (for 4 of the 6 categories)
Reach Stations
CI Rating

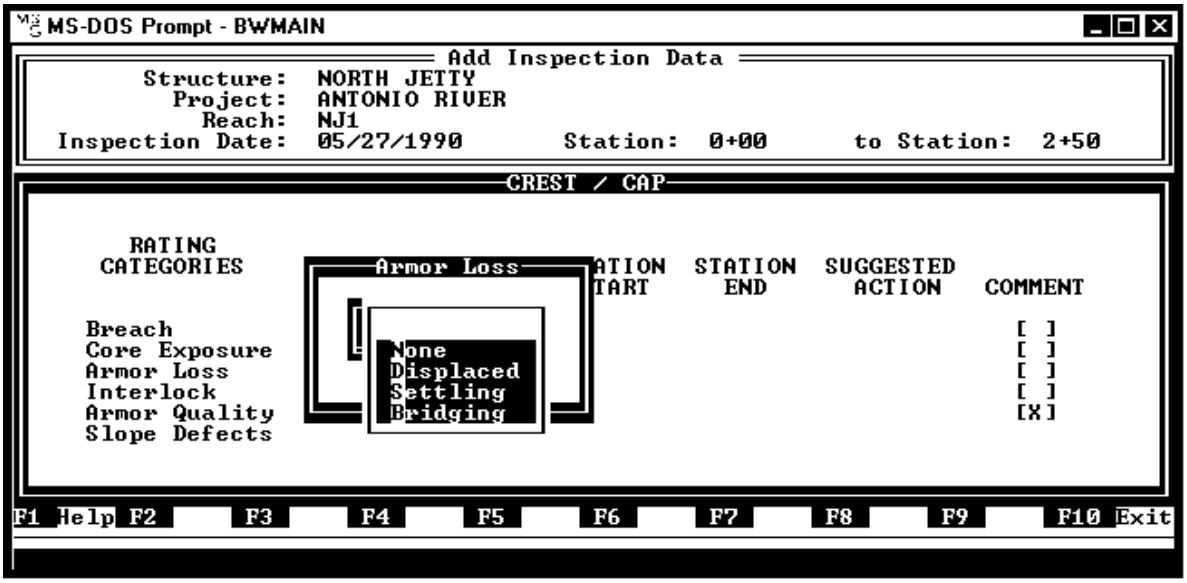
The first entry is the rating (range: 0-100) for each structural rating category. Since **breach** only applies to the **Crest/Cap** area of the reach, it is dimmed (not available for data entry) in the **Seaside** and **Channel/Harborside** screens. Likewise, a **slope defect** applies only to the **Seaside** and **Channel/Harborside** slopes of the reach, therefore, it is dimmed (and not available for data entry) in the **Crest/Cap** screen.

Upon entering the **Defect type** field a pop-up menu appears with the available choices for 4 of the 6 rating categories. These four menus are described below.

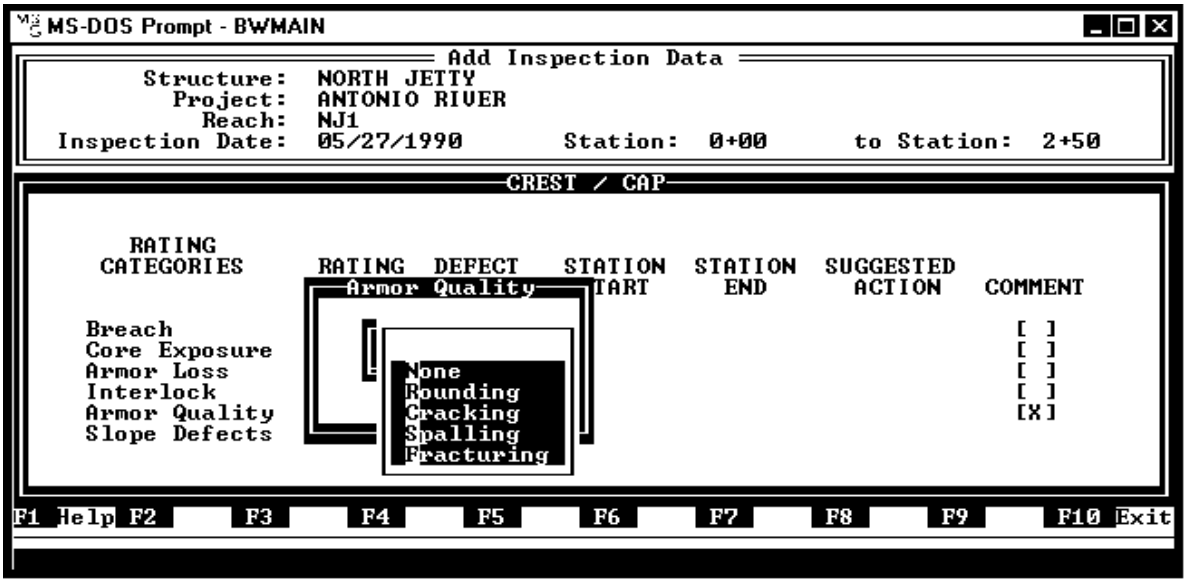
Breach: The defect type pop-up menu for the breach is titled Breach Damage, and has four choices: a blank, **None, Displaced,** and **Settling**. (See example on next page).

Armor Loss: The defect type pop-up menu for armor loss is titled **Armor Loss**, and has 5 choices: a blank, **None, Displaced, Settling**, and **Bridging**. (See example on next page).

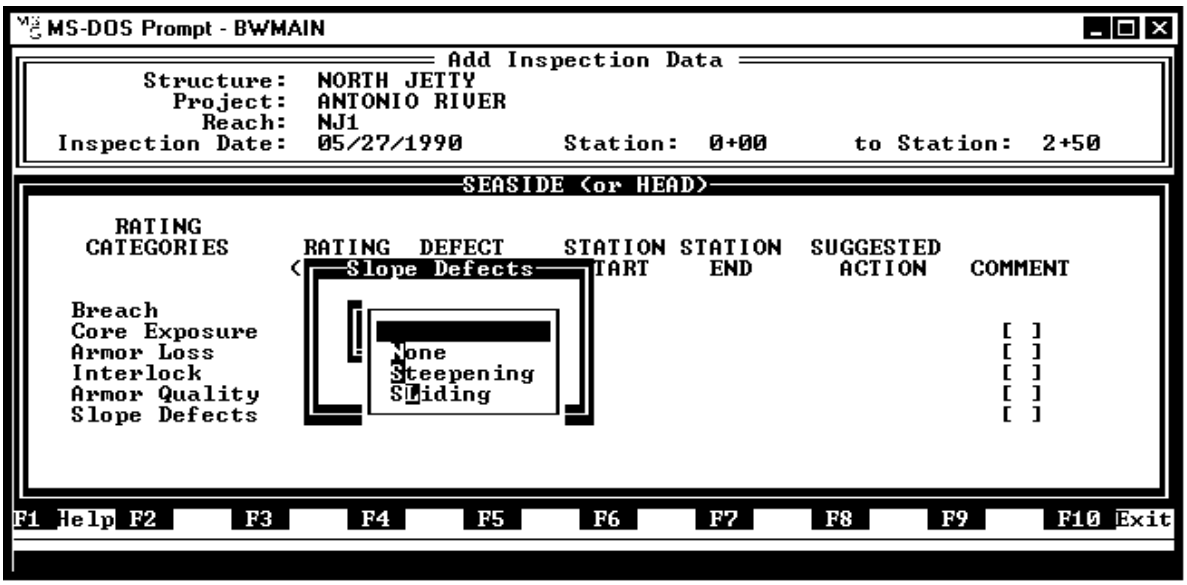




Armor Quality: The defect type pop-up menu for armor quality is titled **Armor Quality**, and has six choices: a blank, **None**, **Rounding, Cracking, Spalling**, and **Fracturing**:



Slope Defects: The defect type pop-up menu for slope defects is titled Slope Defects, and has 4 choices: a blank, **None, Steepening**, and **Sliding**:

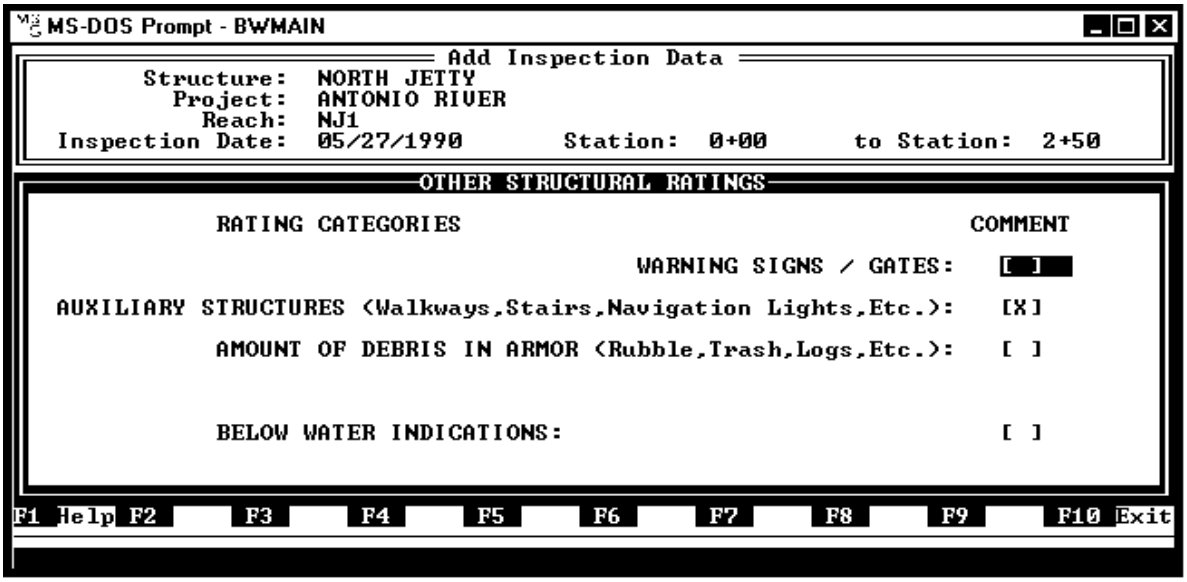


Reach Stations, Suggested Actions, Comments

After completing the defect ratings, the (surveyor's) stationing representing the beginning (**Station Start**) and ending points (**Station End**) of the observed defects are filled in. Next, are the **Suggested Actions**, as explained in the Procedures Manual, and in the right column, a place to mark that a comment is associated with the defect rating. A separate box is then made available in which to write the comments.

Additional Data

Selecting **Additional Data** from the **Select Data to Enter** menu leads to another data entry screen (shown below). There are four comment categories on this screen: **Warning Signs/ Gates, Auxilary Structures, Amount of Debris in Armor**, and **Below Water Indications**. These are explained in the Procedures Manual. The last field, **Below Water Indications**, has a pop-up menu with the following 5 choices: a blank, **Armor Dispacement, Slope Steepening, Slope Sliding**, and **None Visible**.

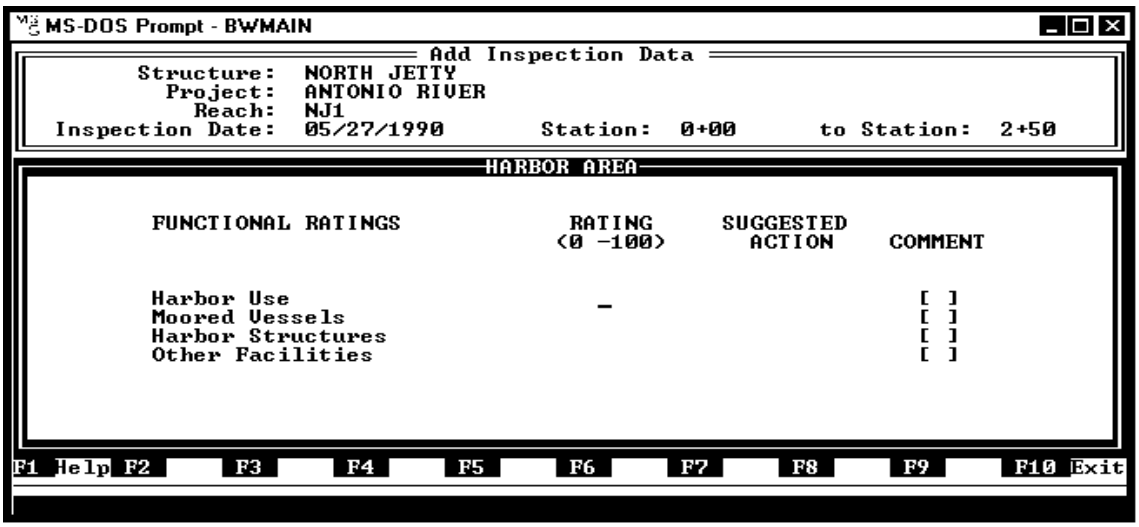


Functional Data

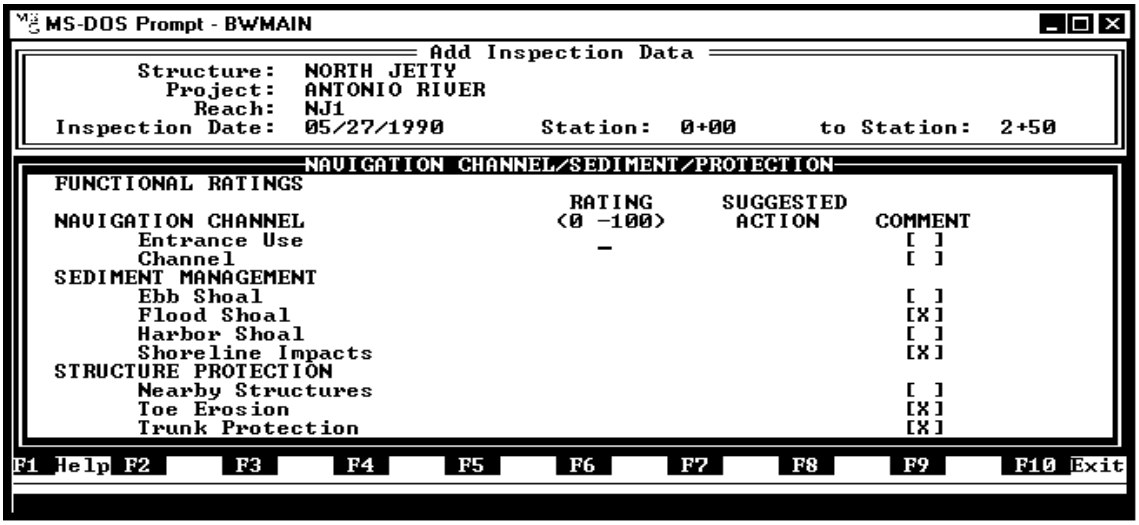
There are three screens for entering Functional Data: **Harbor Area, Channel/Sediment/ Protection,** and **Other Functions.** These match the general format found on the rating form, but are divided due to limited space available on a single screen.

For each category which applies to the reach being rated, enter the desired 0 -100 rating. **If a rating category does not apply to that reach, (i.e. Ebb Shoal) then that category must be left blank. DO NOT USE ZERO**. (Entering zero instead of leaving a category blank will result in incorrect index calculations).

The **Recommended Action** pop-up menu contains six choices: a blank, **Immediate, Act Soon, Watch, Defer**, and **Investigate Further**. These choices are explained in the Procedures Manual. Here is the **Harbor Area** screen:

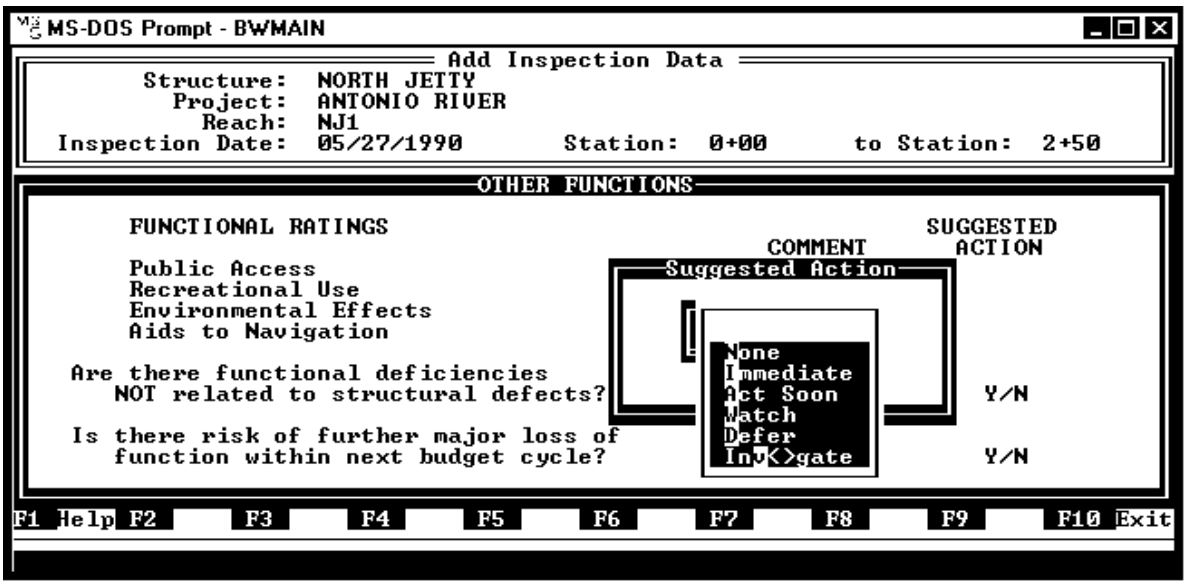


The **Navigation Channel/Sediment/Protection** screen contains three main functional areas, as shown in this example screen:



Other Functions

As described in the Procedures Manual, the four **Other Functions** do not take a rating, but rather a **Suggested Action** and **Comment**. Below **Other Functions** are the two questions which appear at the bottom of the rating form:


MS-DOS Prompt - BWMAIN
Add Inspection Data
Structure: NORTH JETTY
Project: ANTONIO RIVER
Reach: NJ1
Inspection Date: 05/27/1990 Station: 0+00 to Station: 2+50
OTHER FUNCTIONS
FUNCTIONAL RATINGS
COMMENT
SUGGESTED ACTION
Public Access
Recreational Use
Environmental Effects
Aids to Navigation
Are there functional deficiencies NOT related to structural defects?
Y/N
Is there risk of further major loss of function within next budget cycle?
Y/N
Suggested Action
None
Immediate
Act Soon
Watch
Defer
Investigate
F1 Help F2 F3 F4 F5 F6 F7 F8 F9 F10 Exit

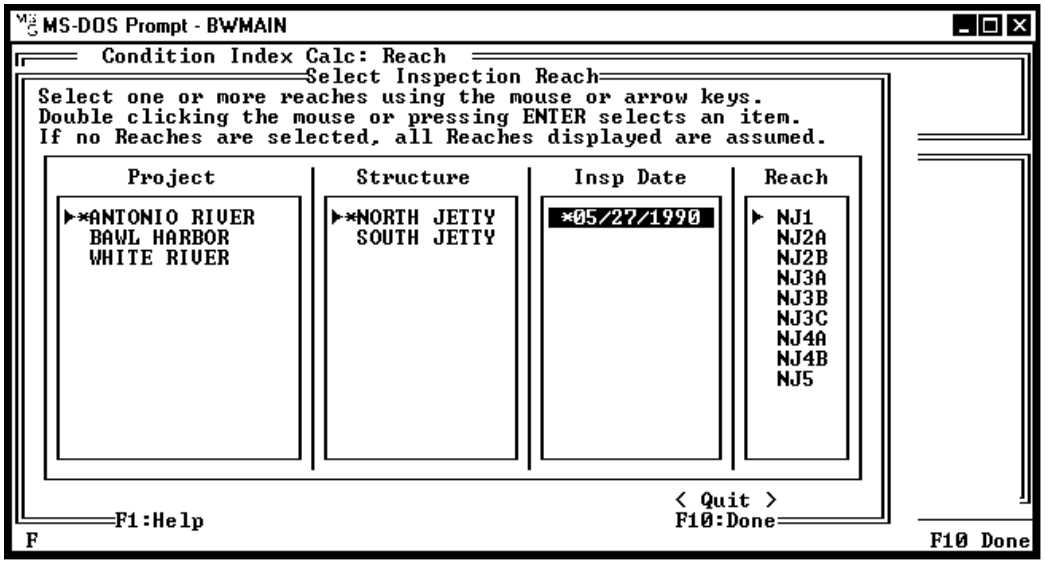
6 Reports and Forms

General Organization and Operation

Selecting **Reports and Forms** from the Main Menu will advance the user to another menu that contains a selection of reports. The items on this menu include:

[1] District Inventory Summary
[2] Condition Index Calc: Reach
[3] Historical Index Rating Summary
[4] Comment Report: Reach
[5] Missing Information Report
[6] Print Inspection Forms
[E] Exit - Return to Main Menu

After selecting a **report type** (from options 1-6 of the Main Menu), the user is given a series of pop-up menus that lead through the hierarchy of the choices. For example, for Condition Index Calc: Reach, a menu listing the projects appears first, then one listing the related structures. Once a structure is chosen, a menu appears with inspection start-dates related to that structure. Finally, the fourth menu shows all the reaches related to that structure. Not all options react in this manner; however, this is the general format:



See **Appendix A** for examples of reports printed with different options.

Two function keys are available on this screen: **F1** for Help, and **F10** for Done. Otherwise, follow directions on the screen for choosing the desired options.

For all report types, after **Accepting** the desired options for a report, hitting **F10** will tell the program to prepare the report. The program will display the **Output Options** screen that provides the following choices: **[T] Terminal, [P] Printer, [F] File**, or **[E] Exit**.

- The **Terminal** option will display the report on the screen.
- The **Printer** option will send the report to a printer.
- The **File** option will prompt the user for a file name and will save the report on disk with the specified file name.
- Exit will bring back the main Report Menu screen.

District Inventory Summary

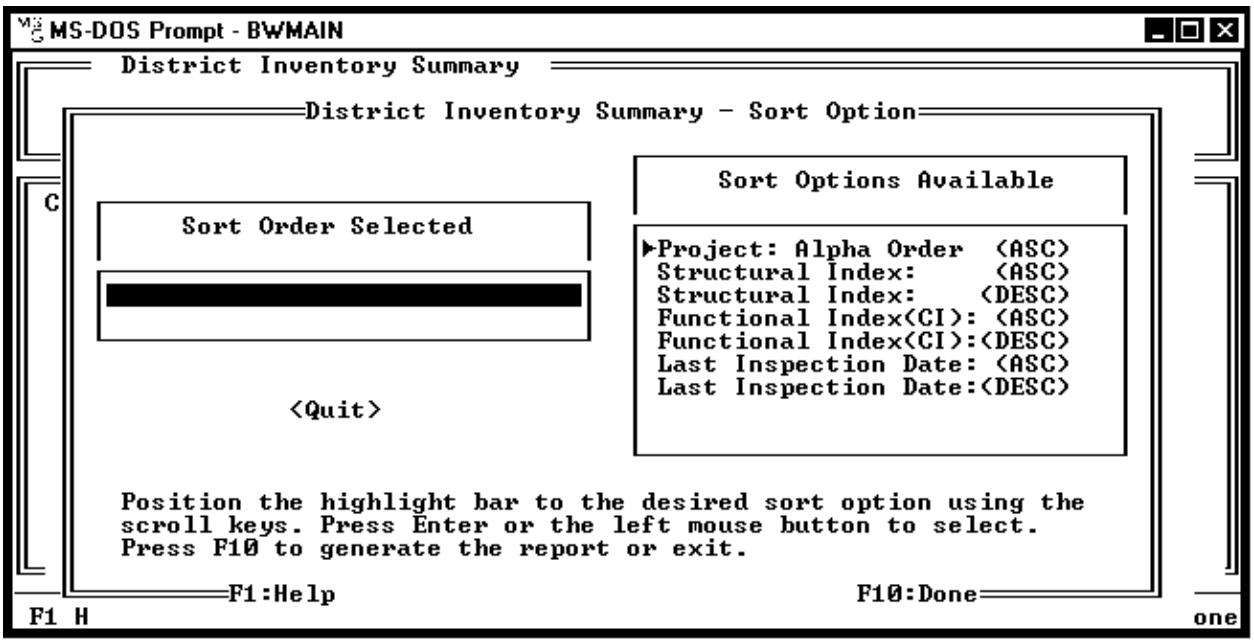
The District Inventory Summary screen (top of next page) gives the user a menu containing a selection of sort options for the reports. The sort options available include:

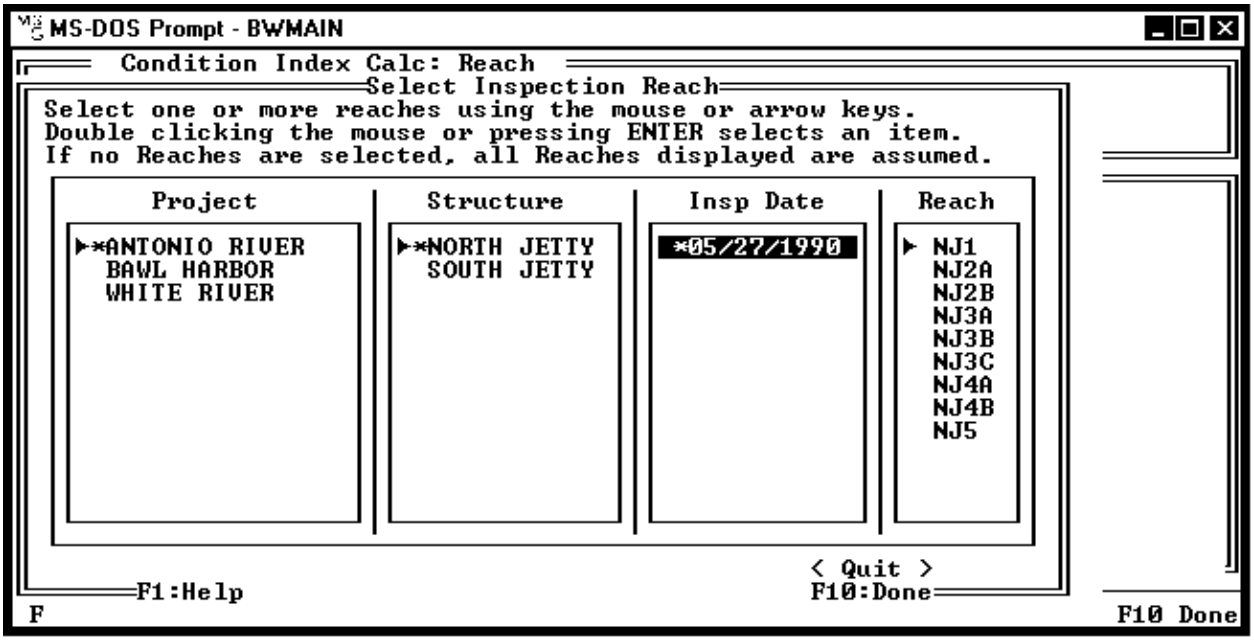
1. Project: Alpha Order (ASC)
2. Structural Index: (ASC)
3. Structural Index: (DESC)
4. Functional Index(CI): (ASC)
5. Functional Index (CI): (DESC)
6. Last Inspection Date: (ASC)
7. Last Inspection Data: (DESC)

Condition Index Calc: Reach

There are four menus involved in producing the Condition Index Calculation: Reach report, which appear in this order: Project Menu, Structure Menu, Inspection Start-Date Menu, and Reach Menu. (See next page for example screen).

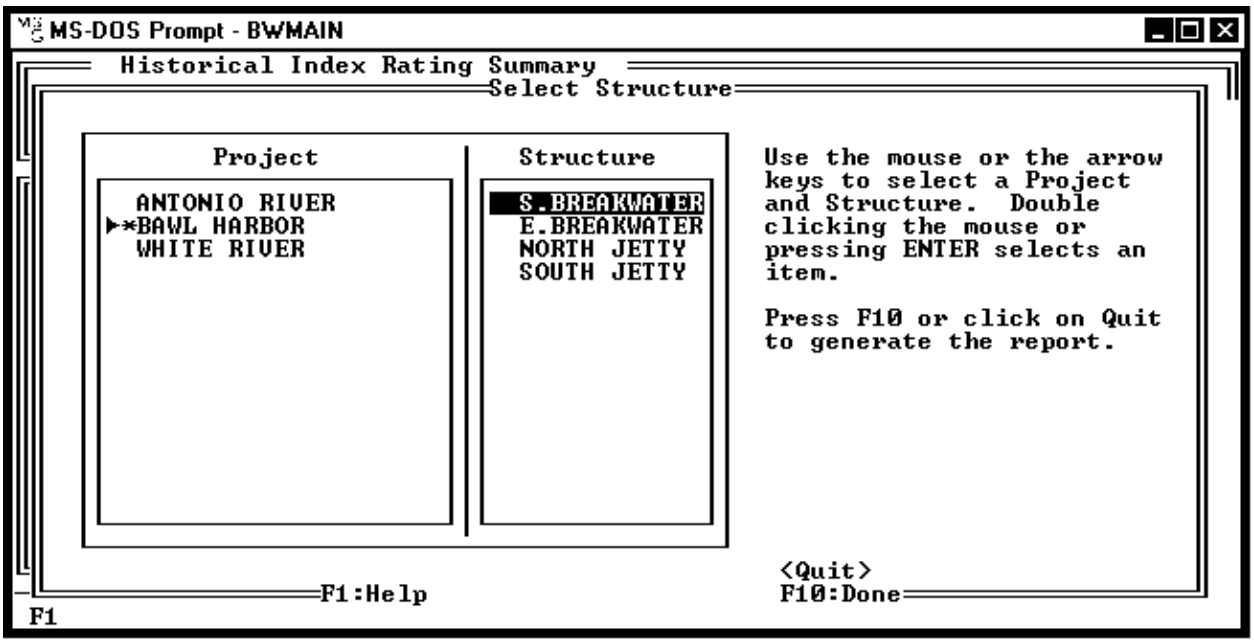
The user may select one inspection start-date for a particular structure and obtain all of the inspection information for all of the reaches for that Inspection start-date. Otherwise, the user may pick one or more reaches for that structure for that particular inspection. In any case the report will include a summary of the structure's overall Structural Index, and Functional Index.





Historical Rating Summary

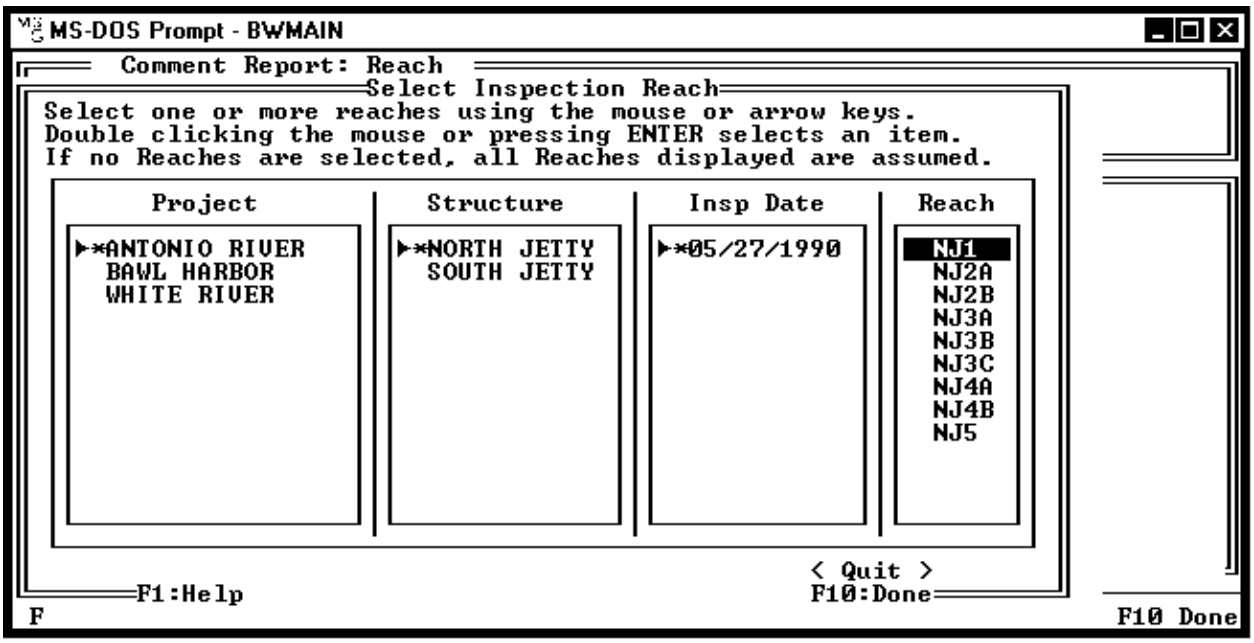
The Historical Index Rating Summary is a report based on a structure's inspection start-dates, structural index, and functional index. This report displays one project at a time. The user will see all of the structures within one project along with the structure's inspection start-dates, structural indexes, and functional indexes. There are two menus to obtain this report. They are Project Menu, and Structure Menu, as shown on the example screen below:



Comment Report: Reach

Obtaining a Comment Report: Reach is exactly like obtaining the Condition Index Calc: Reach Report. The same four menus are presented: Project Menu, Structure Menu, Inspection Start-Date Menu, and Reach Menu.

The user can choose to define the report with the same detail as in the Condition Index Calc: Reach. The format is also similar to a field sheet; however, only the comments are listed in this report. An example screen is shown at the top of the next page.



Missing Information Report

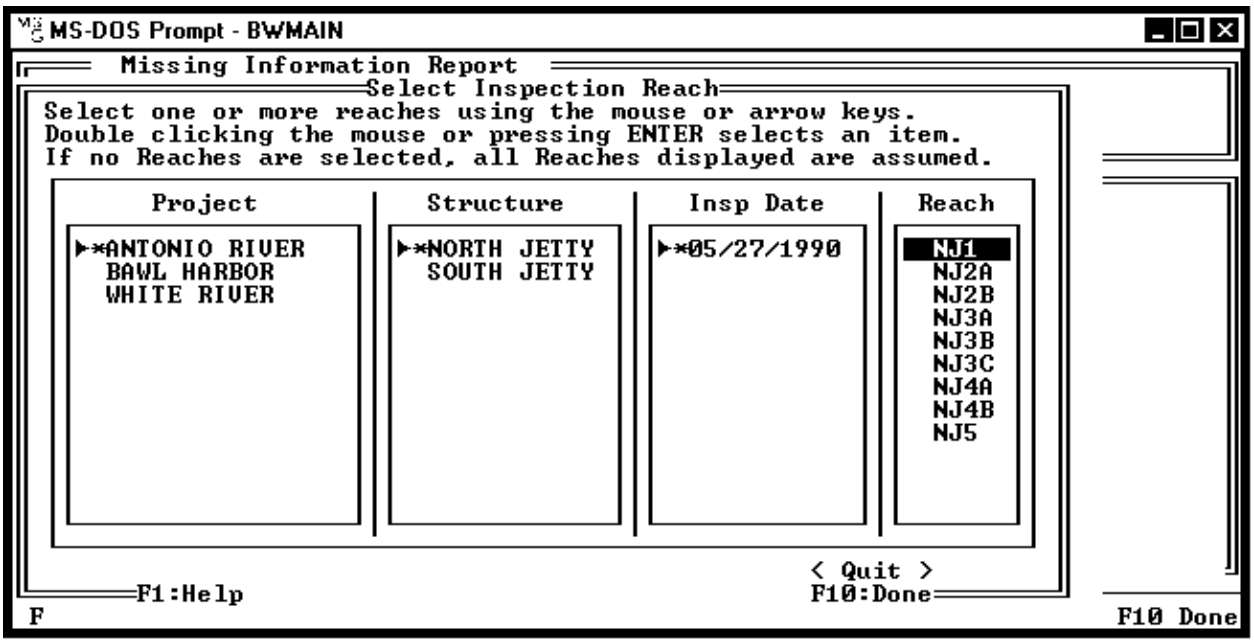
The Missing Information Report has the same menu format as the previously-described reports. This report will give the user a list of items that have not been completed yet. For example, if the user is missing an item in the structural rating categories, this report will show the item that is missing. An example screen is shown at the top of the next page.

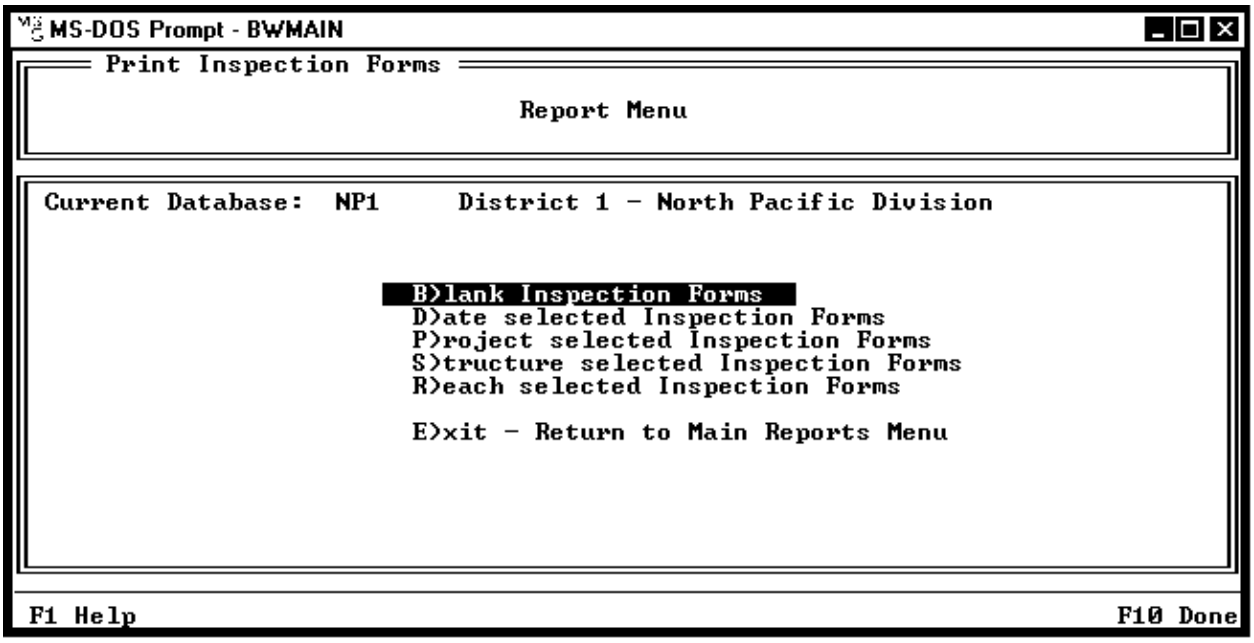
Print Inspection Forms

Selecting the Print Inspection Forms option will give the user a menu listing the types of inspection forms available. The options available include:

1. B)lank Inspection Forms
2. D)ate selected Inspection Forms
3. P)roject selected Inspection Forms
4. S)tructure selected Inspection Forms
5. R)each selected Inspection Forms

See Appendix B for an example of a blank inspection form, and a reach-selected inspection form from the Print Inspection Form options. The other three options operate the same as the Reach option, however, those options will print out all of the reaches within that project, structure, and date. (See example screen on the next page).

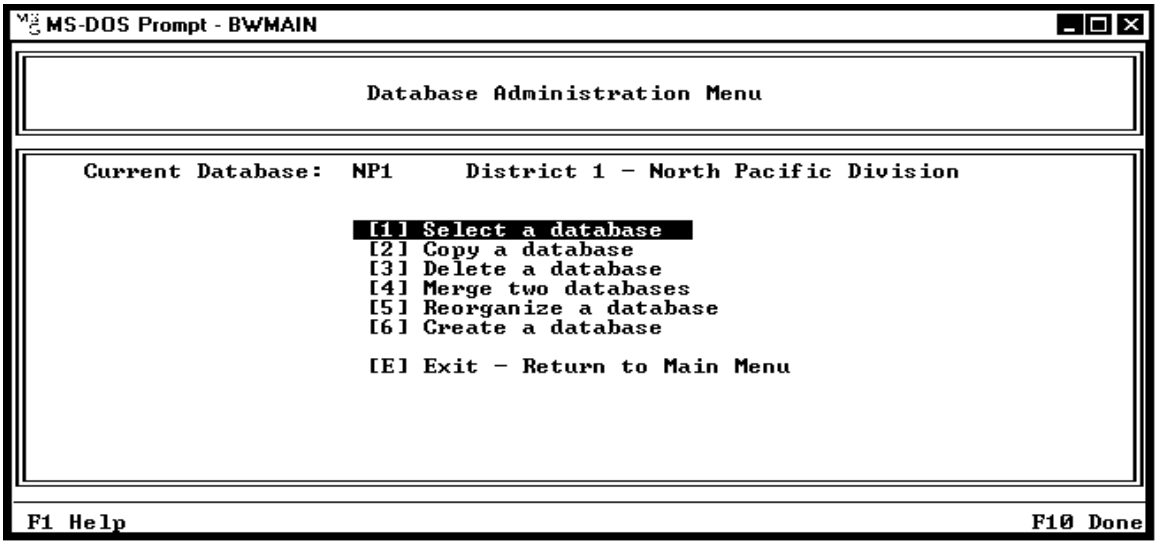

MS-DOS Prompt - BWMAIN
Missing Information Report
Select Inspection Reach
Select one or more reaches using the mouse or arrow keys.
Double clicking the mouse or pressing ENTER selects an item.
If no Reaches are selected, all Reaches displayed are assumed.
Project
Structure
Insp Date
Reach
►*ANTONIO RIVER
BAWL HARBOR
WHITE RIVER
►*NORTH JETTY
SOUTH JETTY
►*05/27/1990
NJ1
NJ2A
NJ2B
NJ3A
NJ3B
NJ3C
NJ4A
NJ4B
NJ5
< Quit >
F1:Help
F10:Done
F
F10 Done


MS-DOS Prompt - BWMAIN
Print Inspection Forms
Report Menu
Current Database: NP1 District 1 - North Pacific Division
B)lank Inspection Forms
D)ate selected Inspection Forms
P)roject selected Inspection Forms
S)tructure selected Inspection Forms
R)each selected Inspection Forms
E)xit - Return to Main Reports Menu
F1 Help
F10 Done

7 Database Administration

Introduction

Selecting Database Administration**,** option 5 on the Main Menu, will bring you to the Database Administration Menu shown below. To select an option, highlight the desired option and press **[ENTER]**.



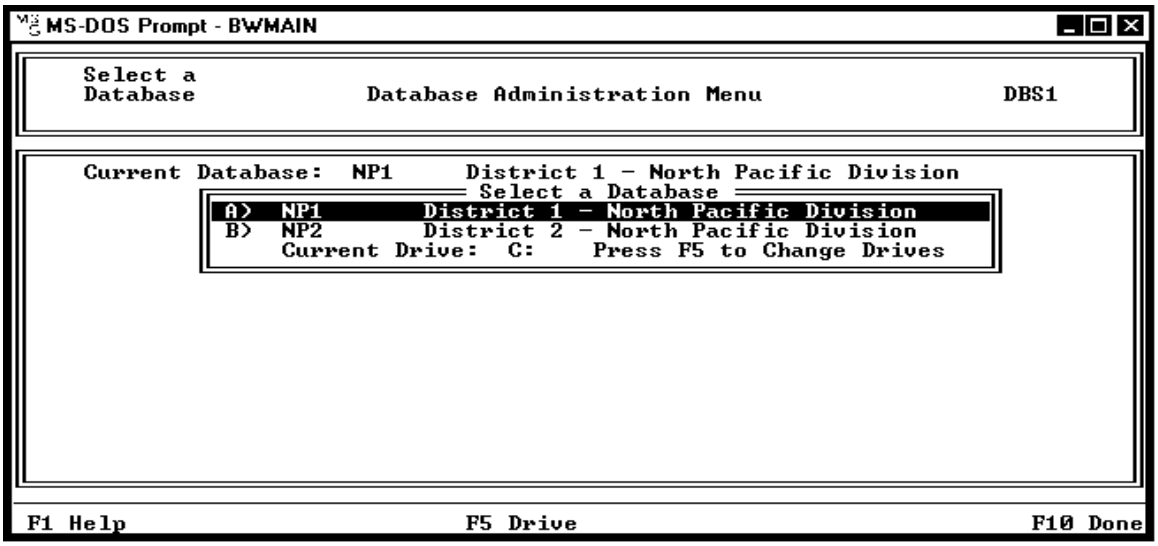
Selecting a Database

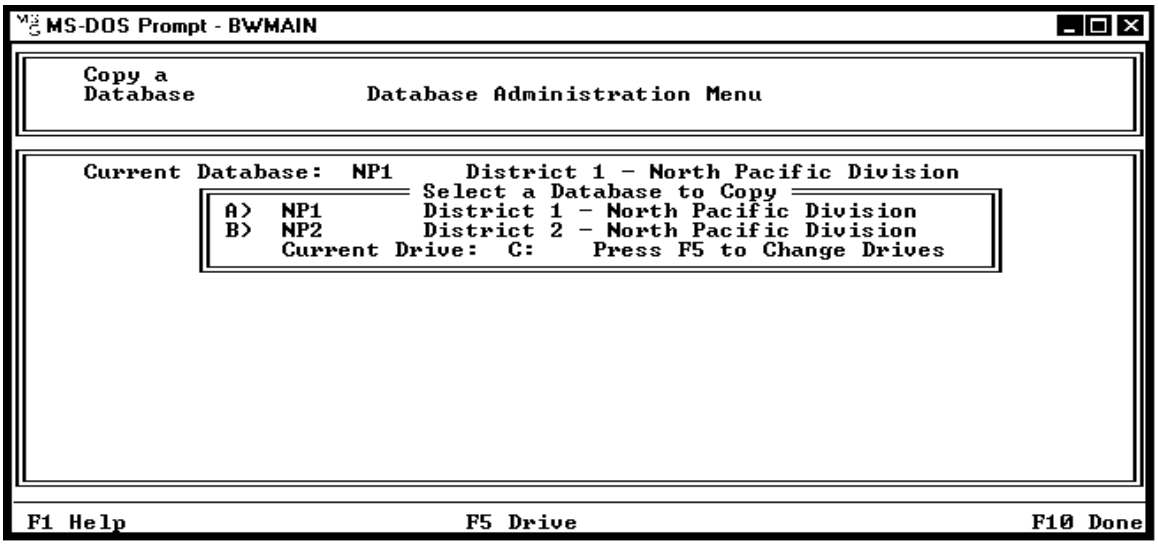
A database must be selected to **add, edit** or **view** any data**.** To select a database, place the highlight bar over **Select a Database** or press the **Number 1**. A pop-up screen will then appear that contains a list of current databases. Place the highlight bar over the desired database and press **[ENTER]** or press the appropriate letter. (See example screen on next page).

Copying a Database

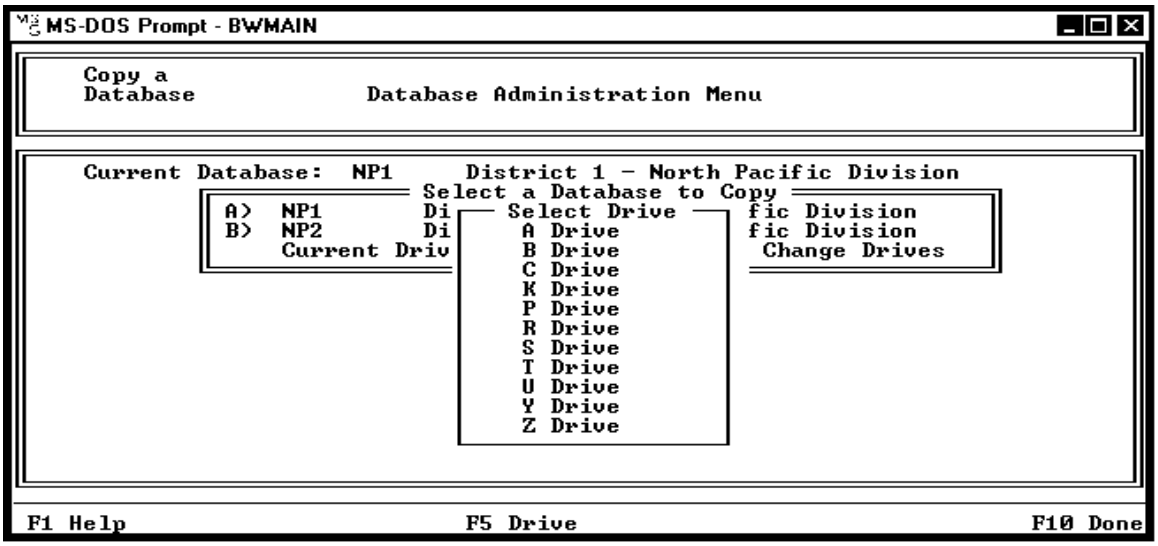
Copying a database enables the transfer of a BREAKWATER database from one workstation to another and allows making a back-up or modifying a copy on the same drive. To make a copy of a database, highlight **Copy a Database** and press **[ENTER]** or press the **number 2**. (See

example screen at bottom of page). The **Select a Database** pop-up screen will appear. Highlight the desired database and press **[ENTER]** or press the appropriate letter.





Pressing **F5** will allow the user to select a different disk drive; another pop-up screen (as shown below) will appear:



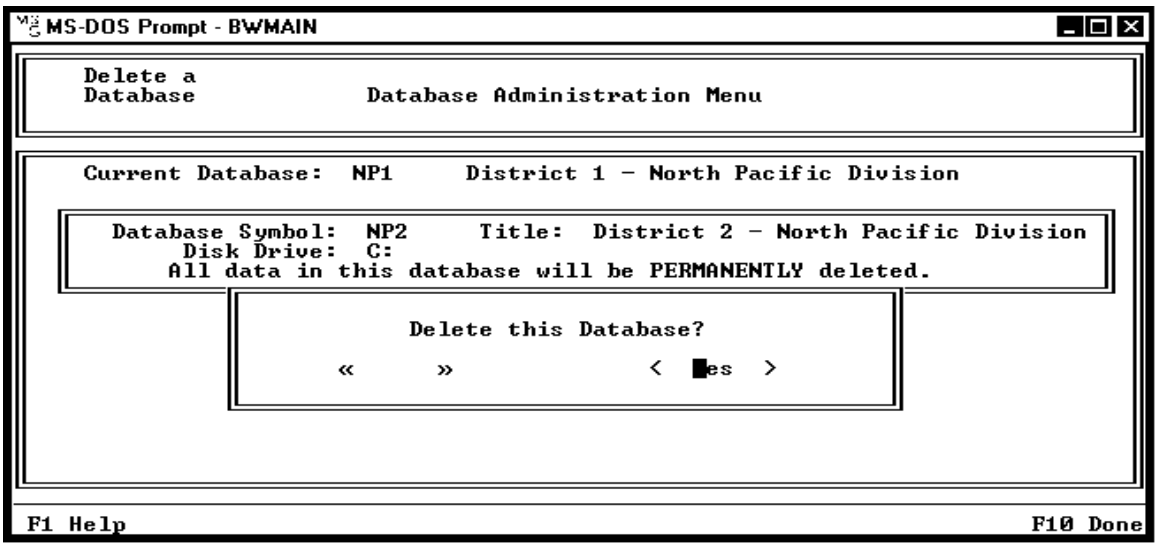
The cursor will be waiting for the user to enter appropriate information and the letter of the disk drive where the copied database is to be written.

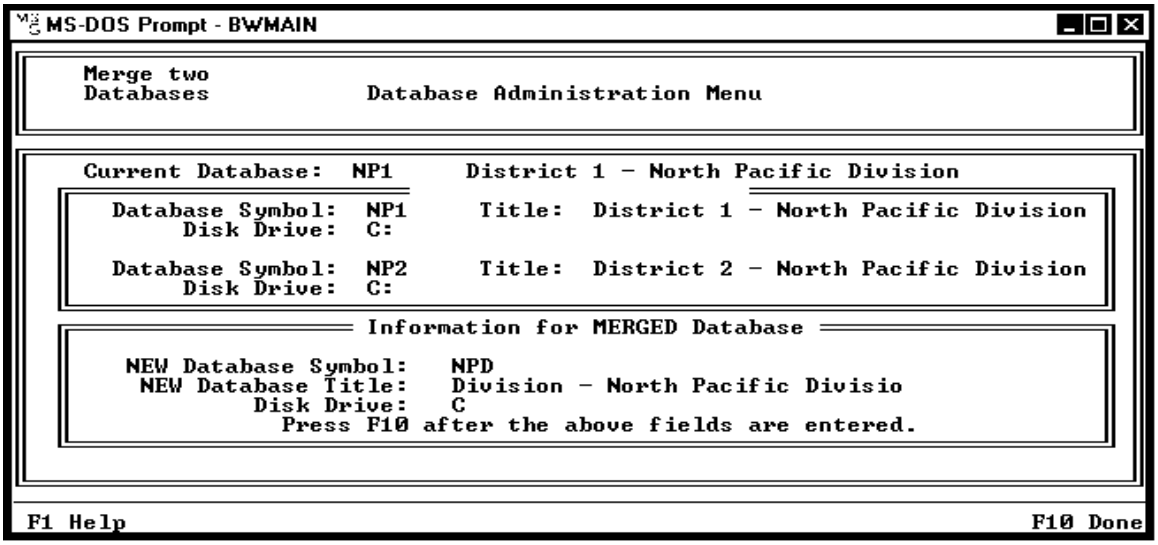
Deleting a Database

When a database is no longer useful and the user wishes to delete it from the disk drive, simply highlight **Delete a Database** and press **[ENTER]** or press the **Number 3**. The **Select a Database** window will appear and the user will select the database. The **Delete a Database** pop-up window will appear for the user to verify that the desired database has been correctly selected. If so, press **Y** for **Yes**. (See example screen at top of next page).

Merging Two Databases

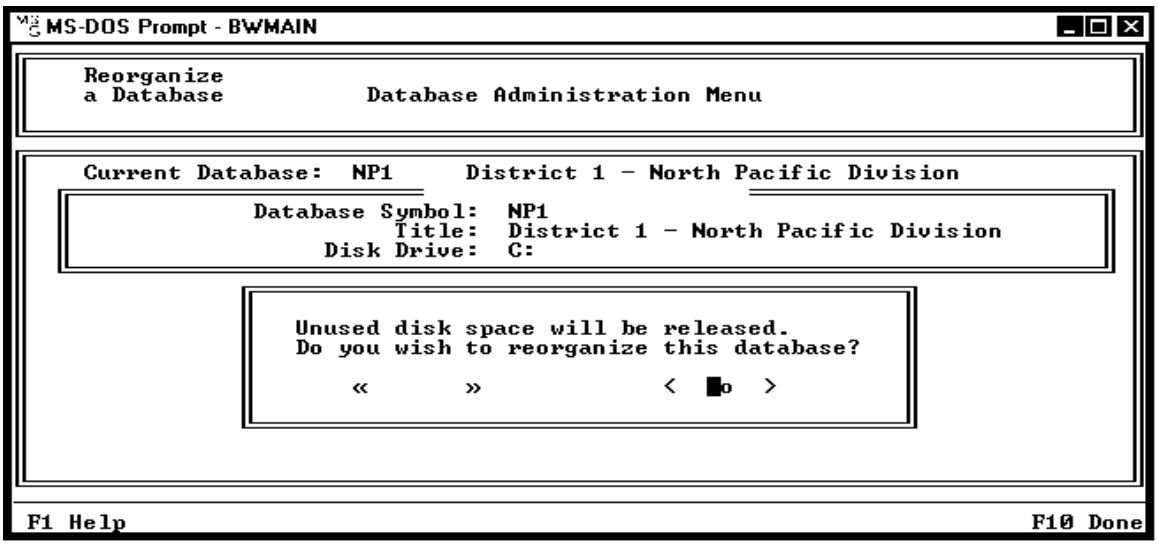
By selecting **Merge Two Databases,** option 4 on the Database Administration Menu, the user will be able to select two databases to be merged. The user must provide the **new database symbol, database title,** and **disk drive**. One database will then be created.
Note that the first database chosen will default as the new database symbol. (See example screen on next page).





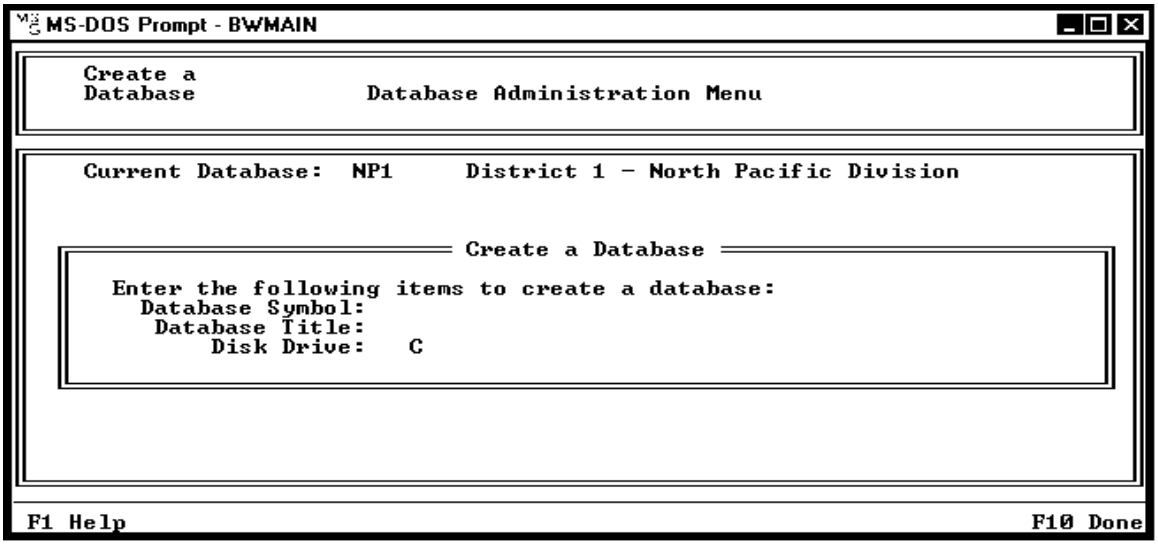
Reorganizing a Database

By selecting **Reorganize a Database,** the user is able to recover disk space from deleted entries. No change in the remaining information is made. See example screen on the next page:



Creating a Database

The user can create a new database by selecting **Create a Database** from the Database Administration menu. The user must then provide a **database symbol** and **database title.** An example screen is shown below:



Appendix A: Reports

District Inventory Summary

Project: Alpha Order	**(ASCENDING)**
Structural Index:	**(ASCENDING)**
Structural Index:	**(DESCENDING)**
Functional Index (CI):	**(ASCENDING)**
Functional Index (CI):	**(DESCENDING)**
Last Inspection Date:	**(ASCENDING)**
Last Inspection Date:	**(DESCENDING)**

Condition Index Calc: Reach

Historical Index Rating Summary

Comment Report: Reach

Missing Information Report

District Inventory Summary

Project: Alpha Order (ASC)

DISTRICT INVENTORY SUMMARY

Date: 20 December 1996 Database: NP1 District 1 Page: 1

District: District 1

Division:

Ordered By: Insp Date(D), Project

Project, State	Structure	Year Cmplt	Structure Length(ft)	Struct Index	Funct Index	Inspection Start Date
ANTONIO RIVER, OR	NORTH JETTY	1967	3450	71	62	05/27/1990
ANTONIO RIVER, OR	SOUTH JETTY	1967	2650	76	57	05/28/1990
BAWL HARBOR, AK	E.BREAKWATER	1957	1750	49	83	05/21/1990
BAWL HARBOR, AK	NORTH JETTY	1957	1570	48	49	05/18/1990
BAWL HARBOR, AK	S.BREAKWATER	1957	1060	78	80	05/16/1990
BAWL HARBOR, AK	SOUTH JETTY	1957	1300	65	69	05/17/1990
WHITE RIVER, CA	NORTH JETTY	1957	1970	73	81	05/21/1990
WHITE RIVER, CA	SOUTH JETTY	1957	975	50	55	05/22/1990

SUMMARY

Lowest Condition Index: 49
Average Condition Index: 67
Highest Condition Index: 83
Total Length of Structures: 14725

District Inventory Summary

Structural Index: (ASC)
Structural Index: (DESC)

DISTRICT INVENTORY SUMMARY

Date: 20 December 1996 Database: NP1 District 1 Page: 1

District: District 1

Ordered By: Struc. Index, Project

Division:

Project, State	Structure	Year Cmplt	Structure Length(ft)	Struct Index	Funct Index	Inspection Start Date
BAWL HARBOR, AK	NORTH JETTY	1957	1570	48	49	05/18/1990
BAWL HARBOR, AK	E.BREAKWATER	1957	1750	49	83	05/21/1990
WHITE RIVER, CA	SOUTH JETTY	1957	975	50	55	05/22/1990
BAWL HARBOR, AK	SOUTH JETTY	1957	1300	65	69	05/17/1990
ANTONIO RIVER, OR	NORTH JETTY	1967	3450	71	62	05/27/1990
WHITE RIVER, CA	NORTH JETTY	1957	1970	73	81	05/21/1990
ANTONIO RIVER, OR	SOUTH JETTY	1967	2650	76	57	05/28/1990
BAWL HARBOR, AK	S.BREAKWATER	1957	1060	78	80	05/16/1990

SUMMARY

Lowest Condition Index: 49
Average Condition Index: 67
Highest Condition Index: 83
Total Length of Structures: 14725

DISTRICT INVENTORY SUMMARY

Date: 20 December 1996 Database: NP1 District 1 Page: 1

District: District 1

Division:

Ordered By: Struc. Index(D), Project

Project, State	Structure	Year Cmplt	Structure Length(ft)	Struct Index	Funct Index	Inspection Start Date
BAWL HARBOR, AK	S.BREAKWATER	1957	1060	78	80	05/16/1990
ANTONIO RIVER, OR	SOUTH JETTY	1967	2650	76	57	05/28/1990
WHITE RIVER, CA	NORTH JETTY	1957	1970	73	81	05/21/1990
ANTONIO RIVER, OR	NORTH JETTY	1967	3450	71	62	05/27/1990
BAWL HARBOR, AK	SOUTH JETTY	1957	1300	65	69	05/17/1990
WHITE RIVER, CA	SOUTH JETTY	1957	975	50	55	05/22/1990
BAWL HARBOR, AK	E.BREAKWATER	1957	1750	49	83	05/21/1990
BAWL HARBOR, AK	NORTH JETTY	1957	1570	48	49	05/18/1990

SUMMARY

Lowest Condition Index: 49
Average Condition Index: 67
Highest Condition Index: 83
Total Length of Structures: 14725

District Inventory Summary

Functional Index (CI): (ASC)
Functional Index (CI): DESC)

DISTRICT INVENTORY SUMMARY

Date: 20 December 1996 Database: NP1 District 1 Page: 1

District: District 1

Ordered By: Func. Index, Project

Division:

Project, State	Structure	Year Cmplt	Structure Length(ft)	Struct Index	Funct Index	Inspection Start Date
BAWL HARBOR, AK	NORTH JETTY	1957	1570	48	49	05/18/1990
WHITE RIVER, CA	SOUTH JETTY	1957	975	50	55	05/22/1990
ANTONIO RIVER, OR	SOUTH JETTY	1967	2650	76	57	05/28/1990
ANTONIO RIVER, OR	NORTH JETTY	1967	3450	71	62	05/27/1990
BAWL HARBOR, AK	SOUTH JETTY	1957	1300	65	69	05/17/1990
BAWL HARBOR, AK	S.BREAKWATER	1957	1060	78	80	05/16/1990
WHITE RIVER, CA	NORTH JETTY	1957	1970	73	81	05/21/1990
BAWL HARBOR, AK	E.BREAKWATER	1957	1750	49	83	05/21/1990

SUMMARY

Lowest Condition Index: 49
Average Condition Index: 67
Highest Condition Index: 83
Total Length of Structures: 14725

DISTRICT INVENTORY SUMMARY

Date: 20 December 1996 Database: NP1 District 1 Page: 1

District: District 1

Ordered By: Func. Index(D), Project

Division:

Project, State	Structure	Year Cmplt	Structure Length(ft)	Struct Index	Funct Index	Inspection Start Date
BAWL HARBOR, AK	E.BREAKWATER	1957	1750	49	83	05/21/1990
WHITE RIVER, CA	NORTH JETTY	1957	1970	73	81	05/21/1990
BAWL HARBOR, AK	S.BREAKWATER	1957	1060	78	80	05/16/1990
BAWL HARBOR, AK	SOUTH JETTY	1957	1300	65	69	05/17/1990
ANTONIO RIVER, OR	NORTH JETTY	1967	3450	71	62	05/27/1990
ANTONIO RIVER, OR	SOUTH JETTY	1967	2650	76	57	05/28/1990
WHITE RIVER, CA	SOUTH JETTY	1957	975	50	55	05/22/1990
BAWL HARBOR, AK	NORTH JETTY	1957	1570	48	49	05/18/1990

SUMMARY

Lowest Condition Index: 49
Average Condition Index: 67
Highest Condition Index: 83
Total Length of Structures: 14725

District Inventory Summary

Last Inspection Date: (ASC)
Last Inspection Date: (DESC)

DISTRICT INVENTORY SUMMARY

Date: 20 December 1996 Database: NP1 District 1 Page: 1

District: District 1

Ordered By: Insp Date, Project Name,Struct

Division:

Project, State	Structure	Year Cmplt	Structure Length(ft)	Struct Index	Funct Index	Inspection Start Date
BAWL HARBOR, AK	S.BREAKWATER	1957	1060	78	80	05/16/1990
BAWL HARBOR, AK	SOUTH JETTY	1957	1300	65	69	05/17/1990
BAWL HARBOR, AK	NORTH JETTY	1957	1570	48	49	05/18/1990
BAWL HARBOR, AK	E.BREAKWATER	1957	1750	49	83	05/21/1990
WHITE RIVER, CA	NORTH JETTY	1957	1970	73	81	05/21/1990
WHITE RIVER, CA	SOUTH JETTY	1957	975	50	55	05/22/1990
ANTONIO RIVER, OR	NORTH JETTY	1967	3450	71	62	05/27/1990
ANTONIO RIVER, OR	SOUTH JETTY	1967	2650	76	57	05/28/1990

SUMMARY

Lowest Condition Index: 49
Average Condition Index: 67
Highest Condition Index: 83
Total Length of Structures: 14725

DISTRICT INVENTORY SUMMARY

Date: 20 December 1996 Database: NP1 District 1 Page: 1

District: District 1

Division:

Ordered By: Project Name, Year Const(D)

Project, State	Structure	Year Cmplt	Structure Length(ft)	Struct Index	Funct Index	Inspection Start Date
ANTONIO RIVER, OR	NORTH JETTY	1967	3450	71	62	05/27/1990
ANTONIO RIVER, OR	SOUTH JETTY	1967	2650	76	57	05/28/1990
BAWL HARBOR, AK	E.BREAKWATER	1957	1750	49	83	05/21/1990
BAWL HARBOR, AK	NORTH JETTY	1957	1570	48	49	05/18/1990
BAWL HARBOR, AK	S.BREAKWATER	1957	1060	78	80	05/16/1990
BAWL HARBOR, AK	SOUTH JETTY	1957	1300	65	69	05/17/1990
WHITE RIVER, CA	NORTH JETTY	1957	1970	73	81	05/21/1990
WHITE RIVER, CA	SOUTH JETTY	1957	975	50	55	05/22/1990

SUMMARY

Lowest Condition Index: 49
Average Condition Index: 67
Highest Condition Index: 83
Total Length of Structures: 14725

Condition Index Calc: Reach

CONDITION INDEX COMPUTATION SHEET PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 1

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ1

Location:Antonio River District:District 1 Division:

Part A: Structure Condition Summary Inspection Start Date: 05/27/1990

STRUCTURE DEFICIENCY	CREST/CAP	SEASIDE/HEAD	CHANNEL/HARBOR	
Breach/Loss of Crest Elev.	100			
Core Exposure/Loss	100	75	100	
Armor Loss	79	60	81	REACH STRUCTURAL INDEX
Armor Contact/Interlock	100	65	100	
Armor Quality Defects	80	75	85	
Slope Defects		60	89	
STRUCTURAL INDEX	85	63	86	69

Are there functional deficiencies which are NOT related to structural defects? (YES NO)= NO

Is there risk of further major loss of function within the next budget cycle? (YES NO)= NO

(ratings not included in CI calculation are marked with an *)

Part B: Functional Rating Summary

	FUNCTION	RATING	RECOMMENDED ACTION	
HARBOR AREA	Harbor Use a.Moored Vessels b.Harbor Structure c.Other Facilities			
NAVIGATION CHANNEL	Entrance Use Channel			
SEDIMENT MANAGEMENT	Ebb Shoal Flood Shoal Harbor Shoal Shoreline Impacts	50 70	Act Soon Act Soon	REACH FUNCTIONAL INDEX
STRUCTURE PROTECTION	Nearby Structures *Toe Erosion *Trunk Protection	80 84	Watch Act Soon	54
OTHER FUNCTIONS	Public Access Recreational Use Environmental Effect Aids to Navigation			

CONDITION INDEX COMPUTATION SHEET PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 2

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ2A

Location:Antonio River District:District 1 Division:

Part A: Structure Condition Summary Inspection Start Date: 05/27/1990

STRUCTURE DEFICIENCY	CREST/CAP	SEASIDE/HEAD	CHANNEL/HARBOR	
Breach/Loss of Crest Elev.	95			
Core Exposure/Loss	100	75	100	
Armor Loss	100	85	90	REACH
Armor Contact/Interlock	75	70	85	STRUCTURAL
Armor Quality Defects	85	45	100	INDEX
Slope Defects		85	85	
STRUCTURAL INDEX	82	54	89	63

Are there functional deficiencies which are NOT related to structural defects? (YES NO)= NO

Is there risk of further major loss of function within the next budget cycle? (YES NO)= NO

(ratings not included in CI calculation are marked with an *)

Part B: Functional Rating Summary

FUNCTION		RATING	RECOMMENDED ACTION	
HARBOR AREA	Harbor Use	80	None	
	a.Moored Vessels	75	Watch	
	b.Harbor Structure	70	Watch	
	c.Other Facilities	70	Watch	
NAVIGATION CHANNEL	Entrance Use			
	Channel	85		
SEDIMENT MANAGEMENT	Ebb Shoal			
	Flood Shoal	55		REACH
	Harbor Shoal	60	Inv<>gate	FUNCTIONAL
	Shoreline Impacts	60		INDEX
STRUCTURE PROTECTION	Nearby Structures			60
	*Toe Erosion	70		
	*Trunk Protection			
OTHER FUNCTIONS	Public Access		Watch	
	Recreational Use			
	Environmental Effect			
	Aids to Navigation			

CONDITION INDEX COMPUTATION SHEET PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 3

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ2B

Location:Antonio River District:District 1 Division:

Part A: Structure Condition Summary Inspection Start Date: 05/27/1990

STRUCTURE DEFICIENCY	CREST/CAP	SEASIDE/HEAD	CHANNEL/HARBOR	
Breach/Loss of Crest Elev.	100			
Core Exposure/Loss	100	100	100	
Armor Loss	100	100	90	REACH
Armor Contact/Interlock	75	70	85	STRUCTURAL
Armor Quality Defects	100	45	100	INDEX
Slope Defects		100	85	
STRUCTURAL INDEX	83	60	89	67

Are there functional deficiencies which are NOT related to structural defects? (YES NO)= NO

Is there risk of further major loss of function within the next budget cycle? (YES NO)= NO

(ratings not included in CI calculation are marked with an *)

Part B: Functional Rating Summary

FUNCTION		RATING	RECOMMENDED ACTION	
HARBOR AREA	Harbor Use	80		
	a.Moored Vessels	75		
	b.Harbor Structure	70	Watch	
	c.Other Facilities	70		
NAVIGATION CHANNEL	Entrance Use			
	Channel	85		
SEDIMENT MANAGEMENT	Ebb Shoal			
	Flood Shoal	55		REACH
	Harbor Shoal	60	Inv<>gate	FUNCTIONAL
	Shoreline Impacts	60		INDEX
STRUCTURE PROTECTION	Nearby Structures			60
	*Toe Erosion	70		
	*Trunk Protection			
OTHER FUNCTIONS	Public Access			
	Recreational Use			
	Environmental Effect			
	Aids to Navigation			

CONDITION INDEX COMPUTATION SHEET PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 4

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ3A

Location:Antonio River District:District 1 Division:

Part A: Structure Condition Summary Inspection Start Date: 05/27/1990

STRUCTURE DEFICIENCY	CREST/CAP	SEASIDE/HEAD	CHANNEL/HARBOR	
Breach/Loss of Crest Elev.	100			
Core Exposure/Loss	100	100	100	
Armor Loss	55	85	100	REACH
Armor Contact/Interlock	85	60	100	STRUCTURAL
Armor Quality Defects	80	100	100	INDEX
Slope Defects		100	100	
STRUCTURAL INDEX	67	71	100	74

Are there functional deficiencies which are NOT related to structural defects? (YES NO)= NO

Is there risk of further major loss of function within the next budget cycle? (YES NO)= NO

(ratings not included in CI calculation are marked with an *)

Part B: Functional Rating Summary

FUNCTION		RATING	RECOMMENDED ACTION	
HARBOR AREA	Harbor Use	85		
	a.Moored Vessels	85		
	b.Harbor Structure	85		
	c.Other Facilities	75	Watch	
NAVIGATION CHANNEL	Entrance Use	90		
	Channel	90		
SEDIMENT MANAGEMENT	Ebb Shoal	85		
	Flood Shoal	95		REACH
	Harbor Shoal	95		FUNCTIONAL
	Shoreline Impacts	90		INDEX
STRUCTURE PROTECTION	Nearby Structures	75	Watch	75
	*Toe Erosion	70		
	*Trunk Protection			
OTHER FUNCTIONS	Public Access			
	Recreational Use			
	Environmental Effect			
	Aids to Navigation			

CONDITION INDEX COMPUTATION SHEET PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 5

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ3B

Location:Antonio River District:District 1 Division:

Part A: Structure Condition Summary Inspection Start Date: 05/27/1990

STRUCTURE DEFICIENCY	CREST/CAP	SEASIDE/HEAD	CHANNEL/HARBOR	
Breach/Loss of Crest Elev.	100			
Core Exposure/Loss	100	100	100	
Armor Loss	55	85	100	REACH
Armor Contact/Interlock	85	60	100	STRUCTURAL
Armor Quality Defects	80	60	100	INDEX
Slope Defects		45	100	
STRUCTURAL INDEX	67	56	100	65

Are there functional deficiencies which are NOT related to structural defects? (YES NO)= NO

Is there risk of further major loss of function within the next budget cycle? (YES NO)= NO

(ratings not included in CI calculation are marked with an *)

Part B: Functional Rating Summary

FUNCTION		RATING	RECOMMENDED ACTION	
HARBOR AREA	Harbor Use	85		
	a.Moored Vessels	95		
	b.Harbor Structure	85		
	c.Other Facilities	75		
NAVIGATION CHANNEL	Entrance Use	90		
	Channel	90		
SEDIMENT MANAGEMENT	Ebb Shoal	85		REACH
	Flood Shoal	95		FUNCTIONAL
	Harbor Shoal	95		INDEX
	Shoreline Impacts	90		
STRUCTURE PROTECTION	Nearby Structures	75	Watch	75
	*Toe Erosion	70		
	*Trunk Protection			
OTHER FUNCTIONS	Public Access			
	Recreational Use			
	Environmental Effect			
	Aids to Navigation			

CONDITION INDEX COMPUTATION SHEET PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 6

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ3C

Location:Antonio River District:District 1 Division:

Part A: Structure Condition Summary Inspection Start Date: 05/27/1990

STRUCTURE DEFICIENCY	CREST/CAP	SEASIDE/HEAD	CHANNEL/HARBOR	
Breach/Loss of Crest Elev.	100			
Core Exposure/Loss	100	85	100	
Armor Loss	100	100	100	REACH STRUCTURAL INDEX
Armor Contact/Interlock	85	60	100	
Armor Quality Defects	80	60	100	
Slope Defects		70	100	77
STRUCTURAL INDEX	86	69	100	

Are there functional deficiencies which are NOT related to structural defects? (YES NO)= NO

Is there risk of further major loss of function within the next budget cycle? (YES NO)= NO

(ratings not included in CI calculation are marked with an *)

Part B: Functional Rating Summary

FUNCTION		RATING	RECOMMENDED ACTION	
HARBOR AREA	Harbor Use	85		
	a.Moored Vessels	85		
	b.Harbor Structure	85		
	c.Other Facilities	75	Watch	
NAVIGATION CHANNEL	Entrance Use	90		
	Channel	90		
SEDIMENT MANAGEMENT	Ebb Shoal	85		
	Flood Shoal	95		REACH FUNCTIONAL INDEX
	Harbor Shoal	95		
	Shoreline Impacts	90		
STRUCTURE PROTECTION	Nearby Structures	75	Watch	75
	*Toe Erosion	70		
	*Trunk Protection			
OTHER FUNCTIONS	Public Access			
	Recreational Use			
	Environmental Effect			
	Aids to Navigation			

CONDITION INDEX COMPUTATION SHEET PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 7

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ4A

Location:Antonio River District:District 1 Division:

Part A: Structure Condition Summary Inspection Start Date: 05/27/1990

STRUCTURE DEFICIENCY	CREST/CAP	SEASIDE/HEAD	CHANNEL/HARBOR	
Breach/Loss of Crest Elev.	85			
Core Exposure/Loss	70	60	100	
Armor Loss	50	85	100	REACH
Armor Contact/Interlock	60	55	100	STRUCTURAL
Armor Quality Defects	90	80	100	INDEX
Slope Defects		50	100	
STRUCTURAL INDEX	59	57	100	65

Are there functional deficiencies which are NOT related to structural defects? (YES NO)= NO

Is there risk of further major loss of function within the next budget cycle? (YES NO)= NO

(ratings not included in CI calculation are marked with an *)

Part B: Functional Rating Summary

FUNCTION		RATING	RECOMMENDED ACTION	
HARBOR AREA	Harbor Use	85		
	a.Moored Vessels	85		
	b.Harbor Structure	85		
	c.Other Facilities	95		
NAVIGATION CHANNEL	Entrance Use	90		
	Channel	90		
SEDIMENT MANAGEMENT	Ebb Shoal	85		
	Flood Shoal	95		REACH
	Harbor Shoal	95		FUNCTIONAL
	Shoreline Impacts	90		INDEX
STRUCTURE PROTECTION	Nearby Structures	75		75
	*Toe Erosion	70		
	*Trunk Protection			
OTHER FUNCTIONS	Public Access			
	Recreational Use			
	Environmental Effect			
	Aids to Navigation			

CONDITION INDEX COMPUTATION SHEET PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 8

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ4B

Location:Antonio River District:District 1 Division:

Part A: Structure Condition Summary Inspection Start Date: 05/27/1990

STRUCTURE DEFICIENCY	CREST/CAP	SEASIDE/HEAD	CHANNEL/HARBOR	
Breach/Loss of Crest Elev.	100			
Core Exposure/Loss	65	60	100	
Armor Loss	50	85	100	REACH
Armor Contact/Interlock	60	55	100	STRUCTURAL
Armor Quality Defects	100	80	100	INDEX
Slope Defects		50	100	
STRUCTURAL INDEX	61	57	100	65

Are there functional deficiencies which are NOT related to structural defects? (YES NO)= NO

Is there risk of further major loss of function within the next budget cycle? (YES NO)= NO

(ratings not included in CI calculation are marked with an *)

Part B: Functional Rating Summary

FUNCTION		RATING	RECOMMENDED ACTION	
HARBOR AREA	Harbor Use	85		
	a.Moored Vessels	85		
	b.Harbor Structure	85		
	c.Other Facilities	95		
NAVIGATION CHANNEL	Entrance Use	90		
	Channel	90		
SEDIMENT MANAGEMENT	Ebb Shoal	85		
	Flood Shoal	95		REACH
	Harbor Shoal	95		FUNCTIONAL
	Shoreline Impacts	90		INDEX
STRUCTURE PROTECTION	Nearby Structures	75		75
	*Toe Erosion	70		
	*Trunk Protection			
OTHER FUNCTIONS	Public Access			
	Recreational Use			
	Environmental Effect			
	Aids to Navigation			

CONDITION INDEX COMPUTATION SHEET PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 9

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ5

Location:Antonio River District:District 1 Division:

Part A: Structure Condition Summary Inspection Start Date: 05/27/1990

STRUCTURE DEFICIENCY	CREST/CAP	SEASIDE/HEAD	CHANNEL/HARBOR	
Breach/Loss of Crest Elev.	100			
Core Exposure/Loss	100	100		
Armor Loss	100	100		
Armor Contact/Interlock	100	100		REACH STRUCTURAL INDEX
Armor Quality Defects	100	100		
Slope Defects		100		
STRUCTURAL INDEX	100	100	N/A	100

Are there functional deficiencies which are NOT related to structural defects? (YES NO)= NO

Is there risk of further major loss of function within the next budget cycle? (YES NO)= NO

(ratings not included in CI calculation are marked with an *)

Part B: Functional Rating Summary

FUNCTION		RATING	RECOMMENDED ACTION	
HARBOR AREA	Harbor Use a.Moored Vessels b.Harbor Structure c.Other Facilities			
NAVIGATION CHANNEL	Entrance Use Channel			
SEDIMENT MANAGEMENT	Ebb Shoal Flood Shoal Harbor Shoal Shoreline Impacts	100		REACH FUNCTIONAL INDEX
STRUCTURE PROTECTION	Nearby Structures *Toe Erosion *Trunk Protection	 100 100		100
OTHER FUNCTIONS	Public Access Recreational Use Environmental Effect Aids to Navigation			

CONDITION INDEX COMPUTATION SHEET FOR STRUCTURE

Date: 20 December 1996 Database: NP1 District 1 Page: 1

Project:ANTONIO RIVER Structure:NORTH JETTY

Location:Antonio River District:District 1 Division:

STRUCTURE RATING SUMMARY Inspection Start Date: 05/27/1990

REACH	REACH SI	REACH FI
NJ1	69	54
NJ2A	63	60
NJ2B	67	60
NJ3A	74	75
NJ3B	65	75
NJ3C	77	75
NJ4A	65	75
NJ4B	65	75
NJ5	100	100

STRUCTURAL INDEX	FUNCTIONAL INDEX	CI FOR STRUCTURE
71	62	62

SUMMARY

Lowest Reach SI : Reach FI = 63: 54

Highest Reach SI : Reach FI = 100:100

Total Length of Structure = 3450

Historical Index Rating Summary

HISTORICAL PROGRESSION OF PROJECT STRUCTURES

Date: 20 December 1996 Database: NP1 District 1 Page: 1

PROJECT: BAWL HARBOR

Location: Bawl Harbor

Structure Historical Index Rating Summary

Structure	Inspection Start Date	Structural Index	Functional Index
E.BREAKWATER	05/21/1990	49	83
	05/16/1990	49	67
NORTH JETTY	05/18/1990	48	49
S.BREAKWATER	05/16/1990	78	80
SOUTH JETTY	05/17/1990	65	69

Comment Report: Reach

COMMENT REPORT PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 1

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ1

Location:Antonio River District:District 1 Division:

Inspection Start Date: 05/27/1990

Part A: Structural Comments

CATEGORY	STRUCTURE DEFICIENCY	COMMENTS
CREST/CAP	Breach/Loss of Crest Elev.	None
	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	Many of these problems have compounded each other.
SEASIDE/ HEAD	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
	Slope Defects	None
CHANNEL/ HARBOR	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
	Slope Defects	None

Part B: Functional Comments

FUNCTION	DEFICIENCY	COMMENTS
HARBOR AREA	Harbor Use	None
	a.Moored Vessels	None
	b.Harbor Structure	None
	c.Other Facilities	None
NAVIGATION CHANNEL	Entrance Use	None
	Channel	None
SEDIMENT MANAGEMENT	Ebb Shoal	None
	Flood Shoal	There are two potentially hazardous shoals which will become a problem if not taken care of.

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ1

Location:Antonio River District:District 1 Division:

Inspection Start Date: 05/27/1990

	Harbor Shoal	None
	Shoreline Impacts	The amount of sediment protecting the shore is not enough to prevent a flood.
STRUCTURE PROTECTION	Nearby Structures	None
	Toe Erosion	Minor scour has occurred at the toe, but there is potential for more scour if the shoreline sediment is not replaced.
	Trunk Protection	The amount of sediment potecting the shore is not enough to prevent a flood.
OTHER FUNCTIONS	Public Access	None
	Recreational Use	None
	Environmental Effect	None
	Aids to Navigation	None
Functional deficiencies NOT related to structural defects?		None
Risk of further major functional loss within next budget cycle?		None

COMMENT REPORT PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 3

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ2A

Location:Antonio River District:District 1 Division:

Inspection Start Date: 05/27/1990

Part A: Structural Comments

CATEGORY	STRUCTURE DEFICIENCY	COMMENTS
CREST/CAP	Breach/Loss of Crest Elev.	The breach detected is minimal, but is noticed due to cracked and sloped concrete. The "Displaced Cap" is due to the section being pushed out of alignment of the other Crest/Cap Section.
	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	Crest/Cap Cracking due to misalignment of the other section.
SEASIDE/ HEAD	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
	Slope Defects	None
CHANNEL/ HARBOR	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
	Slope Defects	None

Part B: Functional Comments

FUNCTION	DEFICIENCY	COMMENTS
HARBOR AREA	Harbor Use	None
	a.Moored Vessels	None
	b.Harbor Structure	Minor erosion at scattered locations.
	c.Other Facilities	None
NAVIGATION	Entrance Use	None

COMMENT REPORT PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 4

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ2A

Location:Antonio River District:District 1 Division:

Inspection Start Date: 05/27/1990

CHANNEL	Channel	None
SEDIMENT MANAGEMENT	Ebb Shoal	None
	Flood Shoal	None
	Harbor Shoal	There is no problem along the channel, however, there has been sediment movement from the channel, and this has affected the harbor area.
	Shoreline Impacts	None
STRUCTURE PROTECTION	Nearby Structures	None
	Toe Erosion	None
	Trunk Protection	None
OTHER	Public Access	The public should be aware of the cracks on the side walks.
FUNCTIONS	Recreational Use	None
	Environmental Effect	None
	Aids to Navigation	None
Functional deficiencies NOT related to structural defects?		None
Risk of further major functional loss within next budget cycle?		None

COMMENT REPORT PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 5

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ2B

Location:Antonio River District:District 1 Division:

Inspection Start Date: 05/27/1990

Part A: Structural Comments

CATEGORY	STRUCTURE DEFICIENCY	COMMENTS
CREST/CAP	Breach/Loss of Crest Elev.	None
	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
SEASIDE/ HEAD	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
	Slope Defects	None
CHANNEL/ HARBOR	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
	Slope Defects	None

Part B: Functional Comments

FUNCTION	DEFICIENCY	COMMENTS
HARBOR AREA	Harbor Use	None
	a.Moored Vessels	None
	b.Harbor Structure	Minor erosion at scattered locations.
	c.Other Facilities	None
NAVIGATION CHANNEL	Entrance Use	None
	Channel	None
SEDIMENT MANAGEMENT	Ebb Shoal	None
	Flood Shoal	None
	Harbor Shoal	There is no problem along the channel, however, there has been sediment movement from the channel, and this has affected the harbor

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ2B

Location:Antonio River District:District 1 Division:

Inspection Start Date: 05/27/1990

	Shoreline Impacts	area None
STRUCTURE PROTECTION	Nearby Structures	None
	Toe Erosion	None
	Trunk Protection	None
OTHER FUNCTIONS	Public Access	None
	Recreational Use	None
	Environmental Effect	None
	Aids to Navigation	None
Functional deficiencies NOT related to structural defects?		None
Risk of further major functional loss within next budget cycle?		None

COMMENT REPORT PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 7

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ3A

Location:Antonio River District:District 1 Division:

Inspection Start Date: 05/27/1990

Part A: Structural Comments

CATEGORY	STRUCTURE DEFICIENCY	COMMENTS
CREST/CAP	Breach/Loss of Crest Elev.	None
	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
SEASIDE/ HEAD	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
	Slope Defects	None
CHANNEL/ HARBOR	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
	Slope Defects	None

Part B: Functional Comments

FUNCTION	DEFICIENCY	COMMENTS
HARBOR AREA	Harbor Use	None
	a.Moored Vessels	None
	b.Harbor Structure	None
	c.Other Facilities	Noticed a little toe scour. Problem may persist.
NAVIGATION CHANNEL	Entrance Use	None
	Channel	None
SEDIMENT MANAGEMENT	Ebb Shoal	None
	Flood Shoal	None
	Harbor Shoal	None
	Shoreline Impacts	None

COMMENT REPORT PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 8

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ3A

Location:Antonio River District:District 1 Division:

Inspection Start Date: 05/27/1990

STRUCTURE	Nearby Structures	It looks like the wave energy is more than what the structure can handle. The structure does, however, seem safe.
PROTECTION	Toe Erosion	None
	Trunk Protection	None
OTHER FUNCTIONS	Public Access	None
	Recreational Use	None
	Environmental Effect	None
	Aids to Navigation	None
Functional deficiencies NOT related to structural defects?		None
Risk of further major functional loss within next budget cycle?		None

COMMENT REPORT PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 9

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ3B

Location:Antonio River District:District 1 Division:

Inspection Start Date: 05/27/1990

Part A: Structural Comments

CATEGORY	STRUCTURE DEFICIENCY	COMMENTS
CREST/CAP	Breach/Loss of Crest Elev.	None
	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
SEASIDE/ HEAD	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
	Slope Defects	None
CHANNEL/ HARBOR	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
	Slope Defects	None

Part B: Functional Comments

FUNCTION	DEFICIENCY	COMMENTS
HARBOR AREA	Harbor Use	None
	a.Moored Vessels	None
	b.Harbor Structure	None
	c.Other Facilities	None
NAVIGATION CHANNEL	Entrance Use	None
	Channel	None
SEDIMENT MANAGEMENT	Ebb Shoal	None
	Flood Shoal	None
	Harbor Shoal	None
	Shoreline Impacts	None

COMMENT REPORT PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 10

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ3B

Location:Antonio River District:District 1 Division:

Inspection Start Date: 05/27/1990

STRUCTURE	Nearby Structures	It looks like the wave energy is more than what the structure can handle. The structure does, however, seem safe.
PROTECTION	Toe Erosion	None
	Trunk Protection	None
OTHER FUNCTIONS	Public Access	None
	Recreational Use	None
	Environmental Effect	None
	Aids to Navigation	None
Functional deficiencies NOT related to structural defects?		None
Risk of further major functional loss within next budget cycle?		None

COMMENT REPORT PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 11

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ3C

Location:Antonio River District:District 1 Division:

Inspection Start Date: 05/27/1990

Part A: Structural Comments

CATEGORY	STRUCTURE DEFICIENCY	COMMENTS
CREST/CAP	Breach/Loss of Crest Elev.	None
	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
SEASIDE/ HEAD	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
	Slope Defects	None
CHANNEL/ HARBOR	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
	Slope Defects	None

Part B: Functional Comments

FUNCTION	DEFICIENCY	COMMENTS
HARBOR AREA	Harbor Use	None
	a.Moored Vessels	None
	b.Harbor Structure	None
	c.Other Facilities	Noticed a little toe scour. Problem may persist.
NAVIGATION CHANNEL	Entrance Use	None
	Channel	None
SEDIMENT MANAGEMENT	Ebb Shoal	None
	Flood Shoal	None
	Harbor Shoal	None
	Shoreline Impacts	None

COMMENT REPORT PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 12

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ3C

Location:Antonio River District:District 1 Division:

Inspection Start Date: 05/27/1990

STRUCTURE	Nearby Structures	It looks like the wave energy is more than what the structure can handle. The structure does, however, seem safe.
PROTECTION	Toe Erosion	None
	Trunk Protection	None
OTHER FUNCTIONS	Public Access	None
	Recreational Use	None
	Environmental Effect	None
	Aids to Navigation	None
Functional deficiencies NOT related to structural defects?		None
Risk of further major functional loss within next budget cycle?		None

COMMENT REPORT PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 13

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ4A

Location:Antonio River District:District 1 Division:

Inspection Start Date: 05/27/1990

Part A: Structural Comments

CATEGORY	STRUCTURE DEFICIENCY	COMMENTS
CREST/CAP	Breach/Loss of Crest Elev.	None
	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
SEASIDE/ HEAD	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
	Slope Defects	None
CHANNEL/ HARBOR	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
	Slope Defects	None

Part B: Functional Comments

FUNCTION	DEFICIENCY	COMMENTS
HARBOR AREA	Harbor Use	None
	a.Moored Vessels	None
	b.Harbor Structure	None
	c.Other Facilities	None
NAVIGATION CHANNEL	Entrance Use	None
	Channel	None
SEDIMENT MANAGEMENT	Ebb Shoal	None
	Flood Shoal	None
	Harbor Shoal	None
	Shoreline Impacts	None

COMMENT REPORT PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 14

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ4A

Location:Antonio River District:District 1 Division:

Inspection Start Date: 05/27/1990

STRUCTURE PROTECTION	Nearby Structures	None
	Toe Erosion	None
	Trunk Protection	None
OTHER FUNCTIONS	Public Access	None
	Recreational Use	None
	Environmental Effect	None
	Aids to Navigation	None
Functional deficiencies NOT related to structural defects?		None
Risk of further major functional loss within next budget cycle?		None

COMMENT REPORT PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 15

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ4B

Location:Antonio River District:District 1 Division:

Inspection Start Date: 05/27/1990

Part A: Structural Comments

CATEGORY	STRUCTURE DEFICIENCY	COMMENTS
CREST/CAP	Breach/Loss of Crest Elev.	None
	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
SEASIDE/ HEAD	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
	Slope Defects	None
CHANNEL/ HARBOR	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
	Slope Defects	None

Part B: Functional Comments

FUNCTION	DEFICIENCY	COMMENTS
HARBOR AREA	Harbor Use	None
	a.Moored Vessels	None
	b.Harbor Structure	None
	c.Other Facilities	None
NAVIGATION CHANNEL	Entrance Use	None
	Channel	None
SEDIMENT MANAGEMENT	Ebb Shoal	None
	Flood Shoal	None
	Harbor Shoal	None
	Shoreline Impacts	None

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ4B

Location:Antonio River District:District 1 Division:

Inspection Start Date: 05/27/1990

STRUCTURE PROTECTION	Nearby Structures	None
	Toe Erosion	None
	Trunk Protection	None
OTHER FUNCTIONS	Public Access	None
	Recreational Use	None
	Environmental Effect	None
	Aids to Navigation	None
Functional deficiencies NOT related to structural defects?		None
Risk of further major functional loss within next budget cycle?		None

COMMENT REPORT PER REACH

Date: 20 December 1996 Database: NP1 District 1 Page: 17

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ5

Location:Antonio River District:District 1 Division:

Inspection Start Date: 05/27/1990

Part A: Structural Comments

CATEGORY	STRUCTURE DEFICIENCY	COMMENTS
CREST/CAP	Breach/Loss of Crest Elev.	None
	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
SEASIDE/ HEAD	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
	Slope Defects	None
CHANNEL/ HARBOR	Core Exposure/Loss	None
	Armor Loss	None
	Armor Contact/Interlock	None
	Armor Quality Defects	None
	Slope Defects	None

Part B: Functional Comments

FUNCTION	DEFICIENCY	COMMENTS
HARBOR AREA	Harbor Use	None
	a.Moored Vessels	None
	b.Harbor Structure	None
	c.Other Facilities	None
NAVIGATION CHANNEL	Entrance Use	None
	Channel	None
SEDIMENT MANAGEMENT	Ebb Shoal	None
	Flood Shoal	None
	Harbor Shoal	None
	Shoreline Impacts	None

Project:ANTONIO RIVER Structure:NORTH JETTY Reach:NJ5

Location:Antonio River District:District 1 Division:

Inspection Start Date: 05/27/1990

STRUCTURE PROTECTION	Nearby Structures	None
	Toe Erosion	None
	Trunk Protection	None
OTHER FUNCTIONS	Public Access	None
	Recreational Use	None
	Environmental Effect	None
	Aids to Navigation	None
Functional deficiencies NOT related to structural defects?		None
Risk of further major functional loss within next budget cycle?		None

Missing Information Report

MISSING INSPECTION REPORT

Date: 07 January 1997 Database: NP1 District 1 Page: 1

PROJECT: ANTONIO RIVER

Location: Antonio River

INSPECTION DATA MISSING

Project	Structure	Start Date	Reach	Item(s) Missing
ANTONIO	NORTH JETTY	05/1990	NJ1	None
		05/1990	NJ2A	None
		05/1990	NJ2B	None
		05/1990	NJ3A	None
		05/1990	NJ3B	None
		05/1990	NJ3C	None
		05/1990	NJ4A	None
		05/1990	NJ4B	None
		05/1990	NJ5	None

Appendix B: Forms

Blank Inspection Form

Reach Selected Inspection Form

Blank Inspection Form

STRUCTURAL RATING FOR RUBBLE BREAKWATERS AND JETTIES Page_____of_____

PROJECT NAME : ANTONIO RIVER_____ Reach: NJ1_____Is Head(Y/N)?N

STRUCTURE NAME : NORTH JETTY_____ Sta : From 0+00_____ to 2+50___

INSPECTOR : _____ Inspection Date : _____Time : Begin _____End _____

WAVE HEIGHT [ft] DAY OF INSPECTION : _____

WAVE ACTION ON STRUCTURE : A. Overtopping B. Non-overtopping

TIDE LEVEL : A. High B. Medium C. Low Stage : feet

WEATHER DAY OF INSPECTION : A. Fair B. Rain C. Fog D. Storming

TYPE OF INSPECTION : A. WALKING B. BOATING C. OTHER _____

RATING CATEGORIES: Rate all items (Circle applicable lettered items)	CREST / CAP		SEASIDE (or HEAD)		CHANNEL/HARBOR SIDE	
	Rating 0-100	Comment Number	Rating 0-100	Comment Number	Rating 0-100	Comment Number
Breach: A) Displaced Cap/Armor B) Settling Cap/Armor						
Core (or Underlayer) Exposure / Loss						
Armor Loss: A) Displaced B) Settling C) Bridging						
Loss of Armor Contact/ Armor interlock						
Armor Quality Defects: A) Rounding B) Cracking C) Spalling D) Fracturing						
Slope Defects: A) Steepening B) Sliding						

Comment No(s) FOUND FAULT SUSPECTED IN: A)Armor displacement B)Slope steepening C)Slope Sliding
Caused by: (a)Scour (b)Settlement (c)Shear (d)Liquefaction

_____Item (A) (B) (C) - (a) (b) (c) (d) Sta_____
_____Item (A) (B) (C) - (a) (b) (c) (d) Sta_____
_____WARNING SIGNS/GATES
_____AUXILIARY STRUCTURES (walkways, stairs, navigation lights, ect.)
_____AMOUNT OF DEBRIS IN ARMOR (rubble, trash, logs, ect.)

SUGGESTED ACTIONS: A) Immediate Action B) Action Soon C) Watch D) Defer E) Investigate Further

Comment Number	Suggested Action	Station Location	COMMENTS AND SKETCHES

STRUCTURAL RATING FOR RUBBLE BREAKWATERS AND JETTIES(Continued)

SUGGESTED ACTIONS: A) Immediate Action B) Action Soon C) Watch D) Defer E) Investigate Further

Comment Number	Suggested Action	Station Location	COMMENTS AND SKETCHES

FUNCTIONAL RATING FOR COASTAL STRUCTURES

FUNCTION		Rating 0 - 100	Comment Number
HARBOR AREA	Harbor Navigation		
	Harbor Use		
	a. Moored Vessels		
	b. Harbor Structures		
	c. Other Facilities		
NAVIGATION CHANNEL	Entrance Use		
	Channel		
SEDIMENT MANAGEMENT	Ebb Shoal		
	Flood Shoal		
	Harbor Shoal		
	Shoreline Impacts		
STRUCTURE PROTECTION	Nearby Structures		
	Toe Erosion		
	Trunk Protection		
OTHER FUNCTIONS	Public Access	[redacted]	
	Recreational Use	[redacted]	
	Environmental Effects	[redacted]	
	Aids to Navigation	[redacted]	

ANTONIO RIVER

PROJECT

NORTH JETTY

STRUCTURE

NJ1

REACH

RATER

RATE OF RATING

Has a structural inspection been recently completed?

YES NO

Comment No.

Are there functional deficiencies which are NOT related to structural defects? YES NO _____

Is there risk of further major loss of function within the next budget cycle? YES NO _____

SUGGESTED ACTIONS: A) Immediate Action B) Action Soon C) Watch D) Defer E) Investigate Further

Comment Number	Suggested Action	COMMENTS AND SKETCHES

FUNCTIONAL RATING FOR COASTAL STRUCTURES

SUGGESTED ACTIONS: A) Immediate Action B) Action Soon C) Watch D) Defer E) Investigate Further

Comment Number	Suggested Action	COMMENTS AND SKETCHES

Reach Selected Inspection Form

STRUCTURAL RATING FOR RUBBLE BREAKWATERS AND JETTIES

Page_____of_____

PROJECT NAME : _____ Reach: _____Is Head(Y/N)?N

STRUCTURE NAME : _____ Sta : From _____ to _____

INSPECTOR : _____ Inspection Date : _____Time : Begin _____End _____

WAVE HEIGHT [ft] DAY OF INSPECTION : _____

WAVE ACTION ON STRUCTURE :
A. Overtopping
B. Non-overtopping

TIDE LEVEL :
A. High B. Medium
C. Low
Stage : feet

WEATHER DAY OF INSPECTION :
A. Fair
B. Rain
C. Fog
D. Storming

TYPE OF INSPECTION : A. WALKING B. BOATING C. OTHER _____

RATING CATEGORIES: Rate all items (Circle applicable lettered items)	CREST / CAP		SEASIDE (or HEAD)		CHANNEL/HARBOR SIDE	
	Rating 0-100	Comment Number	Rating 0-100	Comment Number	Rating 0-100	Comment Number
Breach: A) Displaced Cap/Armor B) Settling Cap/Armor						
Core (or Underlayer) Exposure / Loss						
Armor Loss: A) Displaced B) Settling C) Bridging						
Loss of Armor Contact/ Armor interlock						
Armor Quality Defects: A) Rounding B) Cracking C) Spalling D) Fracturing						
Slope Defects: A) Steepening B) Sliding						

Comment No(s) FOUND FAULT SUSPECTED IN: A)Armor displacement B)Slope steepening C)Slope Sliding
Caused by: (a)Scour (b)Settlement (c)Shear (d)Liquefaction

_____Item (A) (B) (C) - (a) (b) (c) (d) Sta_____
_____Item (A) (B) (C) - (a) (b) (c) (d) Sta_____
_____WARNING SIGNS/GATES
_____AUXILIARY STRUCTURES (walkways, stairs, navigation lights, ect.)
_____AMOUNT OF DEBRIS IN ARMOR (rubble, trash, logs, ect.)

SUGGESTED ACTIONS: A) Immediate Action B) Action Soon C) Watch D) Defer E) Investigate Further

Comment Number	Suggested Action	Station Location	COMMENTS AND SKETCHES

STRUCTURAL RATING FOR RUBBLE BREAKWATERS AND JETTIES(Continued)

SUGGESTED ACTIONS: A) Immediate Action B) Action Soon C) Watch D) Defer E) Investigate Further

Comment Number	Suggested Action	Station Location	COMMENTS AND SKETCHES

FUNCTIONAL RATING FOR COASTAL STRUCTURES

FUNCTION		Rating 0 - 100	Comment Number
HARBOR AREA	Harbor Navigation		
	Harbor Use		
	a. Moored Vessels		
	b. Harbor Structures		
	c. Other Facilities		
NAVIGATION CHANNEL	Entrance Use		
	Channel		
SEDIMENT MANAGEMENT	Ebb Shoal		
	Flood Shoal		
	Harbor Shoal		
	Shoreline Impacts		
STRUCTURE PROTECTION	Nearby Structures		
	Toe Erosion		
	Trunk Protection		
OTHER FUNCTIONS	Public Access	[redacted]	
	Recreational Use	[redacted]	
	Environmental Effects	[redacted]	
	Aids to Navigation	[redacted]	

PROJECT

STRUCTURE

REACH

RATER

RATE OF RATING

Has a structural inspection been recently completed?

YES NO

Comment No.

Are there functional deficiencies which are NOT related to structural defects? YES NO

Is there risk of further major loss of function within the next budget cycle? YES NO

SUGGESTED ACTIONS: A) Immediate Action B) Action Soon C) Watch D) Defer E) Investigate Further

Comment Number	Suggested Action	COMMENTS AND SKETCHES

FUNCTIONAL RATING FOR COASTAL STRUCTURES

SUGGESTED ACTIONS: A) Immediate Action B) Action Soon C) Watch D) Defer E) Investigate Further

Comment Number	Suggested Action	COMMENTS AND SKETCHES

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